

Original Research Article

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Riparian Vegetation of River Bhavani, Pillur Beat, Karamadai Range, Western Ghats – An Intensive Assessment

S.M. Dhivya^{1*} and K. Kalaichelvi²

¹Ph.D. Research Scholar, PG and Research Department of Botany, Vellalar College for Women (Autonomous), Thindal, Erode- 638 012, Tamil Nadu, India

²Associate Professor, PG and Research Department of Botany, Vellalar College for Women (Autonomous), Thindal, Erode- 638 012, Tamil Nadu, India

*Corresponding author.

Abstract

The study aims to examine riparian vegetation of Bhavani river in Pillur Beat (Pillur slope RF and Nellithurai RF), Karamadai Range, Western Ghats, Tamil Nadu, India, during the months of January 2016 to August 2016 with frequent field visits in the study area. A total of 112 plant species belonging to 72 genera of 43 families were reported in the study area, of which trees ranked first with 49 species. Leaves were most frequently used plant part for the treatment of diseases. *Terminalia arjuna* and *Pongamia glabra* were the dominant tree species. The results of the present study clearly brought out the need for preparing and implementing site-specific conservation plans for riparian ecosystem.

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Introduction

River catchment or drainage basin is the natural unit of landscape, combining the link between terrestrial and aquatic ecosystems and it encompasses the entire area of land drained by various tributaries to the main river. The drainage area bordering the stream is called the riparian zone and is of critical importance to the function, as well as the protection and management of a river. Riparian zone has dynamic environments characterised by strong energy regimes, substantial habitat heterogeneity, a diversity of ecological processes and multidimensional gradients (Naiman et al., 1993; Vyas et al., 2012).

Riparian forests have received much attention in the recent years and attracted international concern (Scott et al. 2009), due to their role in providing many ecosystem services such as preventing soil erosion, minimizing floods, enhancing wildlife corridor, habitat for endemic species, etc. The riparian forest has been recognized as “keystone ecosystem”, because it harbours certain unique habitats which are highly influenced by water (Goebel et al., 2003; Sunil et al., 2016)

The use of riparian zones for farming is a predominant activity along the banks of rivers that affects the riparian ecology and ecosystem services and interferes with the ecological functions of wetlands (Gopal et al., 2002).

Disturbances caused by intense usage of riparian zone for agriculture activities have caused much spatial variation in the reported values of native species richness, composition and productivity (Aguiar and Ferreira, 2005; Smakhtin and Anputhas, 2006). Besides affecting the community structure, these disturbances also lead to biodiversity loss (Sultana et al., 2014), polluting the streams (Bere and Mangadze 2014) and could substantially affect the hydrological cycle which in turn impacts the human livelihood activities in the downstream by accelerating floods in the event of heavy rainfall and decreased water availability during summer (Barthelemy et al., 2015). The present study is an attempt in this direction to survey the vegetation of Bhavani River in Pillur beat, Karamadai range, Coimbatore district, Tamil Nadu, India.

Materials and Methods

Description of the study area

Bhavani is a major river in Kongu Nadu region of Tamil Nadu, India. It is the second longest river in Tamil Nadu. Bhavani River is a tributary of the River Cauvery originating from the South West Corner of the Nilgiri hills of the Western Ghats in Tamil Nadu states. The river is 270 kilometers long and flows through the states of Kerala and Tamil Nadu. The drainage basin of this perennial river is spread over an area of 6,200 square kilometers, out of which, eighty seven percent is in Tamil Nadu, nine percent in Kerala and four percent in Karnataka. The river mainly flows through Coimbatore and Erode districts of Tamil Nadu. The major towns situated on the banks of the river are Mukkali, Athikadavu, Koodappatti, Mettupalayam, Bhavanisagar, Sathyamangalam, Aapakudal, Gobichettipalayam, Aavudaiapparai and Bhavani.

Bhavani River originates in the upper regions of the Nilgiris of the Western Ghats. It is joined by twelve rivulets, which drain the southern Nilgiri slopes. The largest tributaries of the Bhavani River are West and East Varagar, which come from the Nilgiris. It is at Mukkali, Bhavani turns in the northeast direction and flows through Attappady plateau for twenty five kilometers and seven kilometers along the interstate border. The Kunda River coming from the north joins the Bhavani River in western Tamil Nadu at Athikadavu. The Bhavani is joined by Siruvani River of Coimbatore district and Kodungarapallam River at Koodappatti on the Kerala-Tamil border. The river then

flows in the east direction along the base of Nilgiris. It enters the plains near Mettupalayam near Bathra - Kaliaman Temple where the Coonoor River coming from Coonoor joins Bhavani. The river moves in the east direction at a distance of 160 kilometers through Erode district cutting across the taluks of Gobichettipalayam and Bhavani before joining the Cauvery in the town of Bhavani. The majestic Bhavani river, (The tributaries Mulli and Aathikadavu rivers combine to form the Bhavani river) along with the forests and mountains form the perfect backdrop to Pillur beat. The Pillur dam was constructed in 1961-1967 across the river. The catchment area of the dam was 460 sq.miles with 1568 MCFT Gross capacity.

Climatic factors of study area

Generally Karamadai range exhibit tropical climate. In Pillur beat the climate varies considerably in different parts of the forests. The Western portions are damper and cooler and the climate gets drier as one proceeds east wards. The plains and lower slopes of the hill are subject to very hot and dry climate. Strong winds and dust storms are common in the hot months. During October, November, December and January, the weather becomes cooler and pleasant. The upper slopes are cooler throughout the year on account of their high elevation. The summer has good deal of rainfall, while the winter has very little. The maximum rain fall is 950 mm. and it is recorded in the month of November. Precipitation is lowest in January, with an average of 11 mm. Most of the precipitation falls in October, averaging 178 mm. The average temperature is 29.3°C, with minimum of 19.3°C and a maximum of 32.6°C. April is the hottest month of the year. December is the coldest month, with temperatures averaging 21.4°C. Between the driest and wettest months, the difference in precipitation is 167 mm. Throughout the year, the temperature vary by 4.9°C (Table 1 and Fig. 1). Location map of the study area is shown in Fig. 2.

Ethnobotanical survey

Seasonal floristic survey of Bhavani watershed was conducted in and around Pillur Beat during Jan 2016, March 2016, June 2016 and Aug 2016. The collected specimens were pressed properly. After drying the specimens were poisoned with 0.1% HgCl₂ dissolved in absolute alcohol and mounted with glue on standard herbarium sheet (42×28cm) following the method of Jain and Rao (1970). The mounted specimens were

identified with the help of regional floras viz., Flora of Tamil Nadu Vol.II (Henry et al., 1987), The Flora of the Tamil Nadu Carnatic (Matthew, 1982) and The Flora of Presidency of Madras (Gamble, 1915; Gamble and Fischer, 1928).

Interviews with tribal practitioners

Ethnobotanical data were collected from the local tribal people. The ethnobotanical data (local name, mode of preparation, medicinal uses) were collected through questionnaire, interviews and discussions among the

tribal practitioners in their local language. Our questionnaire allowed descriptive responses on the plant prescribed, such as part of the plant used, medicinal uses, detailed information about mode of preparation (i.e., decoction, paste, powder and juice). The observations collected during field visits were put to group discussion. The medicinal plants were identified, photographed and sample specimens were collected for preparation of herbarium. Voucher specimens have been deposited in the herbarium of Department of Botany, Vellalar College for Women, Erode, Tamil Nadu, India.

Table 1. Climatic factors of the study area.

Months (2016)	Temperature (°C)		Rain fall (mm)	Rainy days
	Min.	Max.		
Jan	19.3	30.2	Nil	0
Feb	20.3	31.0	40	2
Mar	22.3	31.0	18	1
Apr	23.7	32.0	98.5	7
May	23.8	32.2	169.7	17
June	22.7	30.7	55.2	3
July	22.1	29.2	Nil	0
Aug	22.2	30.0	173	4
Sep	22.1	30.7	360.9	19
Oct	22.0	30.3	505.2	22
Nov	21.1	22.0	950	28
Dec	19.6	21.4	95	6

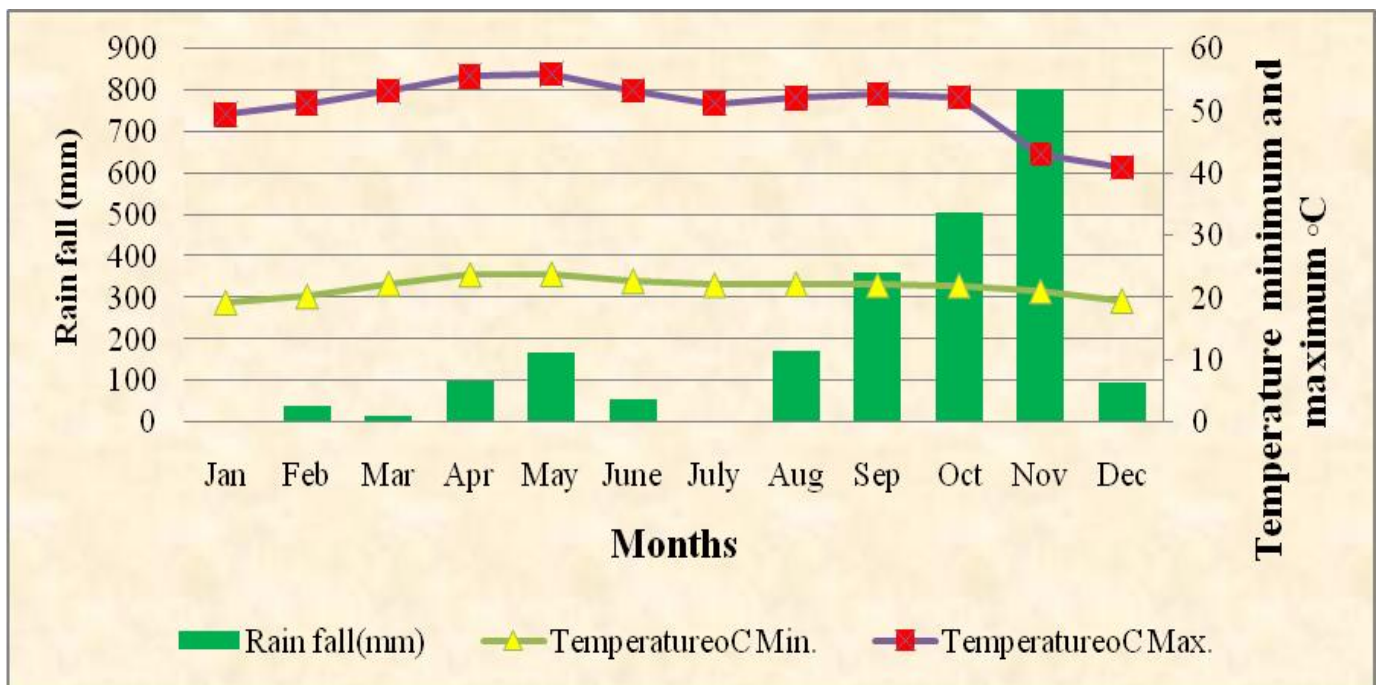


Fig. 1: Ombrothermic graph of Pillur Beat.

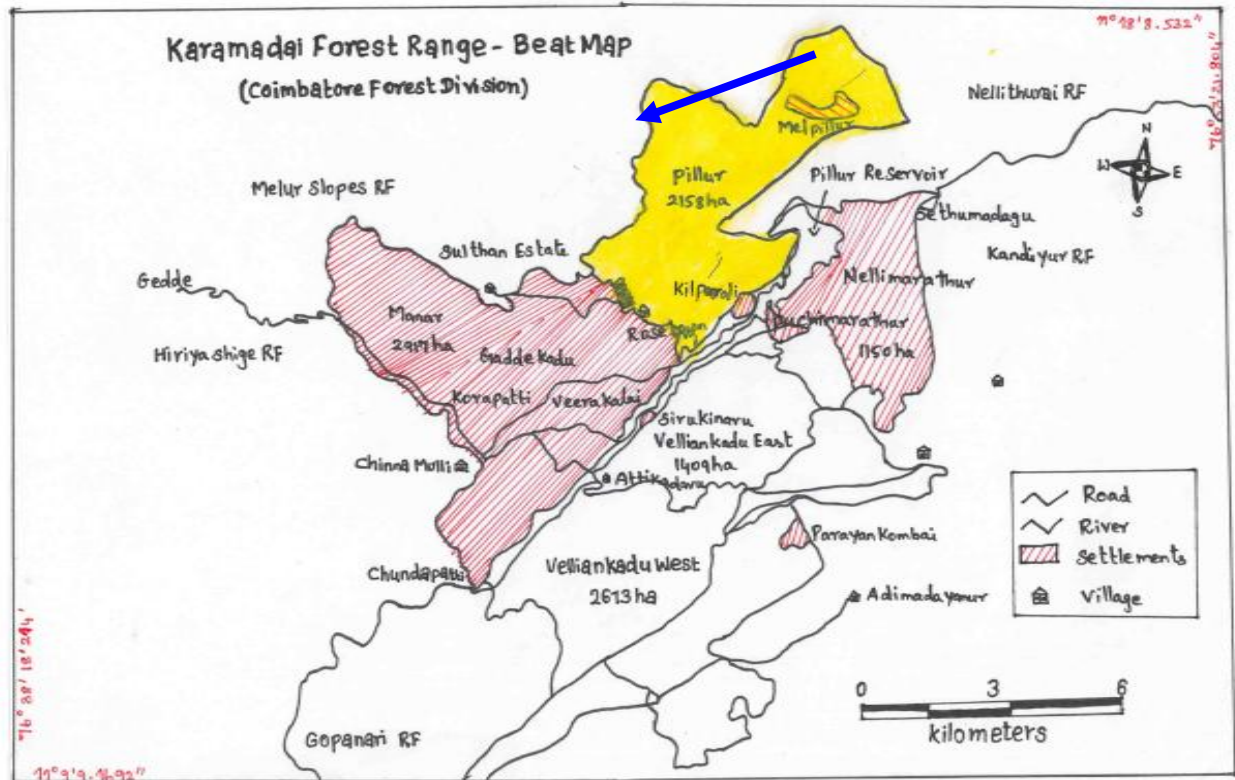


Fig. 2: Location map of the study area.

Results and discussion

A total of 112 medicinally important plant species belonging to 44 families were collected from the study area and their botanical name, family name, local name, parts used, mode of action and their medicinal properties were given in Table 2. Out of the large variety of species available in the study area trees were recorded the maximum numbers (49), followed by herbs (34), shrub (22) and climber (8) (Fig. 3) This is accordance with the finding of Vyas et al. (2012) and Sharma and Gusain (2015). The recurrent use of trees among the indigenous communities is a result of wealth of trees in their environments (Blasco et al., 2014; Sajib and Uddin, 2015; Sujatha and Mariya Selvam, 2015). The diverse parts of the medicinal plants were used by the tribals based on their ability to cure diseases. The parts include leaves, root, bark, seed, fruit, flower, stem, etc. Leaves are the most widely used plant part (52.67%) followed by root (31.25%), whole plant and stem (18.75%), Fruit and bark (16.07%), seed (13.39%), flower (7.14%), tuber and latex (0.89%) (Fig: 4). From the data, it could be inferred that for more number of remedies, fresh leaf materials was used because leaf of plants has been reported to accumulate inulin, tannins and other

alkaloids (Okogwale and Omezezi, 2001) which may be responsible for their medicinal properties, explaining its wide use. Several studies reported that the leaves are the most widely used plant part for many ailments (Sandhya et al., 2006; Ignachimuthu et al., 2006; Kadirvel et al., 2010; Dhivya and Kalaichelvi, 2015).

The dominant species found in the river bank are *Terminalia arjuna*, and *Pongamia glabra* and common trees found in the study area are *Aglaia elaeagnoides*, *Crataeva adansonii*, *Dalbergia sissoo*, *Diospyros malabarica*, *Ficus carica*, *Ficus religiosa*, *Mallotus philippensis*, *Leea indica*, *Phyllanthus polyphyllus*, *Rhus mysorensis*, *Syzygium cumini*, etc. Similarly the common shrubs found in the Bhavani watershed are *Adhatoda vasica*, *Agave americana*, *Jatropha curcus*, *Homonoia riparia*, *Tarenna asiatica*, etc. Whereas, the common herbs found are *Ageratum conyzoides*, *Barleria acuminata*, *Brassica juncea*, *Centella asiatica*, *Curculigo orchoides*, *Lindernia antipoda*, *Lindernia caespitosa*, *Ludwigia peruviana* and *Polygonum hydropiper* etc., and *Cayratia pedata*, *Combretum albidum*, *Ipomaea aegyptia*, *Passiflora foetida*, *Ventilago maderaspatana*, *Mucuna pruriens* and *Tiliacora acuminata* are the common climbers in the

watershed. Taxa of rare occurrence were *Cinnamomum malabathrum*, *Cyanotis calvata*, *Diospyros montana*, *Jatropha curcus*, *Randia dumetorum*, and *Walsura trifoliata*.

Terminalia arjuna a marshy habitat tree indicates its relative richness in forest landscape followed by *Pongamia glabra*, *Crataeva adansonii*, *Dalbergia sissoo*, *Diospyros Montana* and *Ficus carica*. *Pongamia galbra* a deciduous tree is more dominant in the riparian forest than other riparian species such as *Aglaia elaeagnoidea*, *Crataeva adansonii*, *Dalbergia sissoo*, *Diospyros malabarica*, *Ficus carica*, etc. It is a pioneer species which often initiates a secondary succession in the riparian forest replacing the dominant native riparian species. With the availability of water, nutrients and successful hydrochory, the former species has rapidly invaded the riparian zones. In addition to natural events, livestock grazing also creates a suitable niche for *Pongamia glabra* to become dominant because it is less palatable to livestock (Daniel and Hegde 2007).

The dominance of *Pongamia glabra* is not a good sign of a naturally balanced riparian forest because it performs very few ecological functions than native riparian species and may increase in number and expand into new areas of the riparian zone. Riparian landscapes are susceptible to such species due to the frequency of natural disturbances which allow invasive species to propagate and establish along with the mobility provided by flowing water and the connectivity provided by

riparian corridors (Verry et al. 2000; Sunil et al., 2016).

Some species useful in soil conservation of the study area includes, *Dalbergia sissoo*, *Ficus religiosa*, *Ficus tomentosa*, *Ficus benghalensis*, *Mallotus philippensis* among the trees, *Adhatoda vasica*, *Agave americana*, *Barleria acuminata*, *Cassia leschenaultiana*, *Jatropha curcas* and *Ziziphus mauritiana* among shrubs and *Cyanotis calvata*, *Lindernia antipoda* and *Mecardonia procumbens* among the herbs.

Over-utilization of riparian zones for agricultural activities including banana plantation and paddy rice cultivation have led to a decline in evergreen species such as *Jatropha curcus*, *Homonoia riparia* and *Tarenna asiatica*, etc., (Pamela et al. 2008). Several studies have demonstrated that a decline in native riparian species negatively affects the richness and diversity of avian species in the study area (Hinojosa-Huerta 2006; Villasenor-Gomez 2006; Arizmendi et al. 2008; Edward et al. 2008).

This is also evident in the Bhavani watershed, as anthropogenic activities like land clearing for agriculture, road cutting and initiation of hydropower projects are certainly bound to affect the vegetation of the study area. Therefore, development activity needs to be carefully planned and implemented so as to cause minimum damage to the freshwater ecosystem. This is in agreement with the early reports of Sunil et al. (2010); Sharma and Gusain (2015); Sunil et al. (2016).

Table 2. Riparian vegetation of River Bhavani near Pillur Beat.

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Achyranthes bidentata</i> Bl. (Amaranthaceae)	Herb	Sen-nayuruvi	Leaves and flower	Leech bites and diuretic	Decoction
<i>Adhatoda vasica</i> Nees. (Acanthaceae)	Shrub	Adathodai	Leaves and roots	Expectorant and broncho-dialator	Juice
<i>Aganosoma cymosa</i> G.Don. (Apocynaceae)	Climber	Sellakkodi	Whole plant	Anthelmintic, emetic, bronchitis and ophthalmia	Decoction
<i>Agave americana</i> L. (Agavaceae)	Herb	Kantala	Leaves	Antiseptic, diarrhea, diuretic, dysentery, Flatulence, gonorrhoea, hydrophobia, jaundice, snake bites, stomachic, toothache, venereal disease and wounds	Decoction
<i>Ageratum conyzoides</i> L. (Asteraceae)	Herb	Sethupunthalai	Leaves	Skin diseases, itches and sores.	Paste
<i>Aglaia elaeagnoidea</i> (A. Juss.) Benth.(Meliaceae)	Tree	Chokla	Fruits and seeds	Astringent, anti-diarrheal, skin diseases and painful urination	Tonic and paste

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Alysicarpus rugosus</i> DC. (Fabaceae)	Herb	-	Whole plant, root and seed	Worms, diarrhoea, cough, dysentery, colic swelling and cystitis	Extraction, Decoction, powder and paste
<i>Artocarpus integrifolia</i> L. (Moraceae)	Tree	Palamarum	Root bark	Asthma, fever and diarrhea	Extraction
<i>Asclepias curassavica</i> L. (Asclepiadaceae)	Shrub	Neerpoo	Root and whole plant	Pain and ring worm	Paste
<i>Barleria acuminata</i> Wight. (Acanthaceae)	Shrub	Vellaikurinji	Whole plant	Antiseptic, fever, respiratory diseases, tooth ache and joint pain.	Infusion
<i>Barleria buxifolia</i> L. (Acanthaceae)	Shrub	Rosmullippuntu	Leaves	Respiratory diseases, tooth ache and joint pains	Extraction
<i>Bischofia javanica</i> Bl. (Euphorbiaceae)	Tree	Thondi	Bark and leaves	Antiulcer, anthelmintic and anti dysentric	Decoction
<i>Brassica juncea</i> L. Czern. (Brassicaceae)	Herb	Kadugu	Whole plant	Arthritis, foot ache, lumbago and rheumatism	Extraction
<i>Cadaba trifoliata</i> (Roxb.) Wight. & Arn. (Capparidaceae)	Shrub	Kattagatti	Leaves, stem and roots	Anti rheumatic, anthelmintic, antibacterial and viral infection	Decoction, extraction
<i>Calamus rotang</i> L. (Arecaceae)	Shrub	Pirambu	Fruit and leaves	Astringent, antidiarrhoeal, anti-inflammatory, chronic fevers, piles, abdominal tumours, strangury, antibilious, spasmolytic. Wood and vermifuge.	Decoction
<i>Canscora heteroclita</i> (L.) Gilg. (Gentianaceae)	Herb	-	Leaves and whole plant	Anti inflammation, diabetes and digestive disorder	Tonic and paste
<i>Cassia leschenaultiana</i> DC. (Caesalpinaceae)	Shrub		Leaves and stem	Constipation, cold, fever, intestinal disorder, aguesia and skin diseases	Juice and decoction
<i>Cassine glauca</i> (Rottb.) Kuntze. (Celastraceae)	Tree	Karuvali	Bark, leaves and root	Fever and wound healing,	Decoction
<i>Cayratia pedata</i> Juss. (Vitaceae)	Climbing shrub	Kattuperandai	Leaves and whole plant	Astringents, refringents and antiarthritis activity	Extraction and decoction
<i>Centella asiatica</i> (Linn.) Urb. (Apiaceae)	Herb	Vallarai	Leaves	Wound healing, brain tonic and cardio tonic	Infusion
<i>Cinnamomum malabathrum</i> Miq. (Lauraceae)	Tree	Talishapattiri	Stem, bark and leaves	Cough, throat infection, heart complaints, respiratory diseases like flu, sinus and asthma	Decoction
<i>Clerodendron phlomoides</i> Willd. (Verbenaceae)	Small tree	Taluddai	Root and leaves	Syphilitic complaints, gonorrhea, stomach troubles and swelling in cattle	Tonic, juice and decoction
<i>Clerodendron serratum</i> Spr. (Verbenaceae)	Shrub	Angaravalli	Leaves, stem, seed and root	Asthma and respiratory diseases	Paste and decoction
<i>Combretum albidum</i> G. Don. (Combretaceae)	Climber	Vennangukodi	Leaves, fruit and stem bark	Peptic ulcer, diarrhea, dysentery, jaundice and skin diseases	Paste, decoction and juice
<i>Cordia dichotoma</i> G. Forst. (Boraginaceae)	Small tree	Karadisellai	Fruit	Liver damage	Decoction

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Cordia obliqua</i> , Willd. (Boraginaceae)	Small tree	Naruvili	Leaves	Anthelmintic, purgative, diuretic, expectorant, antipyretic, hepatoprotective and analgesic action	Decoction
<i>Cordia sinensis</i> Lam. (Boraginaceae)	Small tree	Sellai	Leaves and fruit	Anti inflammatory blood pressure, hypotensive and diuretic	Decoction
<i>Crataeva adansonii</i> Dc. (Capparidaceae)	Tree	Marvilinga	Stem bark	Joint pain	Decoction
<i>Crataeva religiosa</i> Forst. (Capparidaceae)	Tree	Mavilankai	Bark	Urinary complaints, snake bite and ascites	Decoction
<i>Curculigo orchoides</i> Gaertn. (Hypoxidaceae)	Herb	Nilappanai	Whole plant	Aphrodisiac, appetizer, fattening treatment of piles, biliousness, fatigue, blood related disorders, vomiting, carminative, antipyretic, bronchitis, ophthalmia, indigestion, diarrhea, lumbago, gleet, hydrophobia and joint pains	Decoction
<i>Cyanotis axillaris</i> R.& S. (Commelinaceae)	Herb	Vazhukaipul	Whole plant	Fever and abdominal pains	Decoction
<i>Cyanotis clavata</i> (Linn.) (Commelinaceae)	Herb	Kuthiraikulambadi	Leaves and roots	Cough, biliousness, lumbago, blood disorders and diarrhea	Decoction and juice
<i>Cyanotis wightii</i> Cl. (Commelinaceae)	Herb	-	Root	Cough, diarrhea, dysentery, fever and indigestion	Decoction and paste
<i>Dalbergia coromandeliana</i> Prain. (Fabaceae)	Tree	Nukkam	Leaves, bark and fruit	Wound healing and skin diseases	Decoction and paste
<i>Dalbergia lanceolaria</i> L. f. (Fabaceae)	Tree	Erigai	Seeds, root and leaves	Mild laxatives and inflammatory	Tonic and juice
<i>Dalbergia latifolia</i> Roxb. (Fabaceae)	Tree	Nukkam	Leaves, seeds and fruit	Fever, cough, skin diseases and worms	Extraction
<i>Dalbergia sissoo</i> Roxb. (Fabaceae)	Tree	-	Leaves, root and wood	Diabetic, gonorrhea anti-inflammatory, astringent, leprosy, boils, eruptions and to allay and vomiting	Infusion
<i>Diospyros buxifolia</i> (Blume.) Hiern. (Ebenaceae)	Tree	Irapalai	Leaves, stem and flower	Anti viral, anti HIV and indigestion	Decoction
<i>Diospyros chloroxylon</i> (Blume.) Hiern. (Ebenaceae)	Tree	-	Bark, stem and leaves	Rheumatism, swelling, joint pain and wound healing	Decoction
<i>Diospyros ebenum</i> (Blume.) Hiern. (Ebenaceae)	Tree	Acha	Whole plant	Astringent, attenuant and lithotriptic	Extraction
<i>Diospyros malabarica</i> (Blume.) Hiern. (Ebenaceae)	Tree	Tumbika	Bark, leaves, flowers and fruits	Cold, anthelmintic activity, heal sores, wounds, blood diseases, diarrhea and dysentery, fever and snake bites	Juice, decoction and tonic
<i>Diospyros montana</i> (Blume.) Hiern. (Ebenaceae)	Tree	Bankini	Leaves	Treat boils	Decoction

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Diospyros zeylanica</i> (Blume.) Hiern. (Ebenaceae)	Tree	-	Root, leaves and seeds	Stomach cancer, diarrhoea, intestinal ailments, laxative and chewed for sore throat	Juice
<i>Ficus arnottiana</i> Miq. (Moraceae)	Tree	Kodiuarasu	Stem, bark and leaves	Wound healing and skin diseases	Infusion and paste
<i>Ficus bengalensis</i> L. (Moraceae)	Tree	Aal	Bark and latex	Rheumatism, dysentery, diabetes, gonorrhoea and piles	Juice
<i>Ficus benjamina</i> Linn. (Moraceae)	Tree	Pimpri	Whole plant	Ulcers and leprosy	Decoction
<i>Ficus carica</i> L. (Moraceae)	Tree	Simaiyattai	Bark, leaves and stem	Anti-inflammatory and throat infection	Decoction
<i>Ficus microcarpa</i> Wight. (Moraceae)	Tree	Kallichchi	Whole plant	Rheumatism, laxative, fever, blood purifier	Infusion
<i>Ficus racemosa</i> L. (Moraceae)	Tree	Atthi	Roots and fruits	Blood- purifier and laxative	Decoction
<i>Ficus religiosa</i> L. (Moraceae)	Tree	Arasu	Bark and leaves	Purgative, vomiting and mouth ulcer	Decoction
<i>Ficus tjakela</i> Burm. (Moraceae)	Tree	-	Leaves and stem	Fever, cough, and cold	Decoction
<i>Ficus tomentosa</i> Roxb. (Moraceae)	Tree	-	Leaves and bark	Poultice, boils, cuts and wound	Paste and crushed leaves
<i>Givotia moluccana</i> (L.) Sreem. (Euphorbiaceae)	Tree	Ventali	Fruit, stem, flower and leaves	Rheumatism, skin diseases, dandruff and wound healing	Decoction and paste
<i>Homonoia riparia</i> Lour. (Euphorbiaceae)	Shrub	Kattalri	Root	Laxative, diuretic, piles, stone in the gall bladder, gonorrhoea, syphilis and thirst	Decoction
<i>Hugonia mystax</i> L. (Linaceae)	Tree	Modhirakkanni	Root and leaves	Febrifuge, intestinal worms, swelling, anti dote to snake bites and dysentery.	Powder and Decoction
<i>Ipomaea aegyptia</i> L. (Convolvulaceae)	Climber	-	Leaves	Fever and cough	Decoction
<i>Ipomaea cordifolia</i> Carey ex Voight. (Convolvulaceae)	Herb	Mancalkatampu	Root	Skin diseases	Decoction
<i>Ipomaea obscura</i> K-Gawl. (Convolvulaceae)	Herb	Siruthaali	Seed, root and leaves	Anthelmintic, diuretic and laxative	Decoction
<i>Ipomaea staphylina</i> Rome. & Schult. (Convolvulaceae)	Climbing shrub	Unnagodi	Root	Anti dotes for snake-bite.	Tonic
<i>Jatropha curcas</i> L. (Euphorbiaceae)	Shrub	Kattamanakku	Leaves, stem and seeds	Liver, detoxifier, anticancerous, diuretic, laxative, bitter tonic, antispasmodic, good against, infective hepatitis, restores normal color to urine epilepsy, gastritis, wounds, poisoning, Purgative, anthelmintic, rheumatism and skin diseases.	Decoction

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Jatropha glandulifera</i> Roxb. (Euphorbiaceae)	Shrub	Adalai	Seeds	Purgative, laxative and antioxidant	Extraction
<i>Jatropha gossypifolia</i> L. (Euphorbiaceae)	Shrub	Adalai	Leaves, seed and stem	Antibiotic, insecticidal tooth ache, blood purifier and anti cancer	Decoction
<i>Lantana indica</i> Roxb. (Verbenaceae)	Shrub	Kuzhaloothipalam	Whole plant	Skin diseases and poisonous bites	Decoction and paste
<i>Leea indica</i> (Burm. f.) Merr. (Vitaceae)	Tree	Erattayani	Root and leaves	Diarrheal, chronic dysentery and head invertigo	Decoction and juice
<i>Leucas lanata</i> Benth. (Lamiaceae)	Herb	-	Leaves	Wound healing, anti microbial and anti oxidant	Paste and juice
<i>Leucas pubescens</i> Benth. (Lamiaceae)	Herb	Kuvalayam	Leaves	Antipyretic, antifungal and antimicrobial	Decoction
<i>Lindernia antipoda</i> (L.) Alston. (Scrophulariaceae)	Herb	-	Whole plant and root	Emmenagogue, astringent, diarrhea and anthelmintic.	Decoction
<i>Lindernia caespitosa</i> (Blume) G. Panigrahi (Scrophulariaceae)	Herb	Panigrahi	Whole plant	Fever, cough, cold and anti inflammatory	Decoction
<i>Lindernia crustacea</i> (L.) F. Muell. (Scrophulariaceae)	Herb	Elumburukki	Whole plant	Emetic, treating bilious disorders, dysentery, amenorrhoea, hepatitis and relieve diarrhoea	Decoction and infusion
<i>Litsea scrobiculata</i> Meisn. (Lauraceae)	Tree	Mulakunari	Bark, leaves, fruits and root	Diarrhea, dysentery and fractured limbs	Decoction
<i>Lonicera japonica</i> Thunb. (Caprifoliaceae)	Herb	-	Stem and flowers	Respiratory tract, skin diseases, tumors and bacterial dysentery	Decoction
<i>Ludwigia abyssinica</i> A. Rich. (Onagraceae)	Herb	-	Leaves	Abdominal pain and wound healing	Paste
<i>Ludwigia octovalvis</i> Roxb. (Onagraceae)	Herb	Karamigida	Whole plant	Remedy for venereal diseases	Decoction
<i>Ludwigia perennis</i> L. (Onagraceae)	Herb	Neerkarayambu	Stem	Aching gums, fever and cough	Paste and tonic
<i>Ludwigia peruviana</i> (L.)H. (Onagraceae)	Herb	Kattukkirampu	Whole plants	Dysentery, purgative and vermifuge	Decoction
<i>Macaranga peltata</i> M. Arg. (Euphorbiaceae)	Tree	Vattakanni	Flower, fruit, bark and leaves	Kidney stones, cuts, iron tools and bone fracture	Decoction and extraction
<i>Mallotus philippinensis</i> M. Arg. (Euphorbiaceae)	Tree	Kapli	Root and whole plant	Purgative, scabies and cutaneous troubles	Juice and decoction
<i>Mallotus stenanthus</i> M. Arg. A. (Euphorbiaceae)	Tree	Karuvallichi	Leaves and fruits	Fever and wound healing	Decoction
<i>Malvastrum coromandelianum</i> (L.) Gracke (Malvaceae)	Herb	Kalakarandai	Leaves	Urinary disorder and poisonous bites	Infusion
<i>Mecardonia procumbens</i> (Mill.) Small (Scrophulariaceae)	Herb	-	Leaves and root	Fever, cough and wound healing	Infusion
<i>Mucuna pruriens</i> (L.) DC. (Fabaceae)	Climber	Punaippidukkan	Root, stem and leaves	Snake bite and intestinal disorders	Juice and decoction
<i>Naravelia zeylanica</i> DC. (Ranunculaceae)	Climber	Kattuseekkaai kodi	Leaves, root and flowers	Head ache, fever, tooth ache, ulcer and skin diseases	Paste, tonic and decoction

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Neptunia oleracea</i> Lour. (Mimosaceae)	Herb	Sundaikkirai	Root	Bones of the nose and hard palate, hyphilis and ear to cure earache	Juice
<i>Ophiopogon intermedins</i> Don. (Haemodoraceae)	Herb	-	Tuber and root	Itching, skin diseases, gastric reflux and other gastric problems	Decoction
<i>Oxalis corniculata</i> L. (Oxalidaceae)	Herb	Puliyarai	Leaves	Stomach pain	Decoction
<i>Pandanus odoratissimus</i> Roxb. (Pandanaaceae)	Small tree	Thazhampoo	Leaves	Antipyretic, expectorant, diuretic, cardiotoxic, purgative, leprosy, mallpox, scabies, heart and brain diseases.	Juice
<i>Passiflora foetida</i> L. (Passifloraceae)	Shrub	Mupparisavalli	Fruit	Asthma and bronchitis	Decoction
<i>Passiflora leschenaultii</i> Dc. (Passifloraceae)	Shrub	-	Leaves	Blood pressure and diabetes	Decoction
<i>Phyllanthus polyphyllus</i> Willd. (Euphorbiaceae)	Tree	Arunelli	Leaves, seeds, fruits, stem and bark	Jaundice, gonorrhoea and diabetes	Juice and decoction
<i>Polygonum chinense</i> L. (Polygonaceae)	Shrub	Garhwal	Tuber	Nerve damage, lymphnode and inflammation	Dry powder
<i>Polygonum glabrum</i> Willd. (Polygonaceae)	Herb	Paregudi	Root and young stem	Piles, jaundice and constipation	Decoction
<i>Polygonum hydropiper</i> L. (Polygonaceae)	Herb	-	Leaves and flowers	Cholera, respiratory ailments and Stop excessive bleeding	Decoction
<i>Pongamia glabra</i> Vent. (Fabaceae)	Tree	Pungamaram	Bark and seed oil	Skin diseases	Decoction
<i>Psilotrichum nudum</i> Moq. (Amaranthaceae)	Herb	-	Leaves	Fever and asthma	Extraction
<i>Randia dumetorum</i> Lam. (Rubiaceae)	Tree	Karamul	Whole plant	Cough, skin diseases, ulcers, asthma, flatulence, colic and emesis	Decoction
<i>Rhus mysorensis</i> Heyne. (Anacardiaceae)	Tree	Chippamaram	Fruit and leaves	Dysentery, itching, diarrhea, stomatitis, rash, allergy, diabetesfamine periods, HSV ₂ infection and antifertility	Decoction, juice and extraction
<i>Strobilanthes canaricus</i> Bedd. (Acanthaceae)	Climber	Neelakkurinji	Leaves and root	Chronic ulcer, cough and fever	Decoction and tonic
<i>Syzigium cumini</i> (L.) Skeels. (Myrtaceae)	Tree	Naval	Seeds	Diabetics and reduce the level of sugar in the blood	Decoction
<i>Symphorema involucratum</i> Roxb. (Verbenaceae)	Climber shrub	Vellaimallikkodi	Stem, root and seeds	Fever, cough and skin diseases	Extraction and infusion
<i>Tamarindus indica</i> L. (Caesalpinaceae)	Tree	Puli	Fruit pulp leaves, bark, seed and flowers	Digestive, carminative, laxative, ophthalmia, eye diseases and vaginal discharges.	Decoction
<i>Tarenna asiatica</i> L. (Rubiaceae)	Shrub	Velichi	Fruits	Eyelids to arrest infection	Extraction

Name of the plants (Family)	Habit	Local names	Parts used	Therapeutical uses	Mode of action
<i>Tephrosia purpurea</i> Pers. (Fabaceae)	Herb	Kavali	Roots, seeds leaves and bark	Digestible, anthelmintic, alexiteric, antipyretic, cure diseases of liver, spleen, heart, blood, tumours, ulcers, leprosy, asthma and poisoning	Decoction, juice, extraction and tonic
<i>Tephrosia villosa</i> W. & A. (Fabaceae)	Shrub	-	Leaves	Leprosy, ulcers, asthma, tumors, liver damage, spleen, heart, and blood, dyspepsia, diarrhea, rheumatism, asthma and urinary disorders.	Decoction
<i>Terminalia arjuna</i> W. & A. (Combretaceae)	Tree	Marutham	Bark	Snake bite, fever and diarrhea	Paste
<i>Terminalia chebula</i> Retz. (Combretaceae)	Tree	Kadukkai	Leaves and stem	Skin diseases, relieves inflammation, useful in ascites and useful in worms infestation	Extraction and juice
<i>Tiliacora acuminata</i> Miers. (Menispermaceae)	Climber	Vallikanjiram	Root and whole plant	Kidney stones and snake bites	Paste and decoction
<i>Ventilago maderaspatana</i> Gaertn. (Rhamnaceae)	Climber	Surulbataaikkoti	Stem and leaves	Fever, skin diseases, leprosy, scabies, prurities, diabetes, digestive and stomach ache	Decoction and paste
<i>Vernonia albicans</i> Dc. (Asteraceae)	Herb	Nayecity	Root and leaves	Fever, bacterial infection and cough	Paste and decoction
<i>Vernonia cinerea</i> Less. (Asteraceae)	Herb	Naichotte	Leaves, stem and fruit	Leucorrhoea, dysuria, spasm of bladder and asthma	Decoction
<i>Vitex altissima</i> L.f. (Verbenaceae)	Tree	Mayilainochi	Leaves and root	Inflammation, wounds, ulcer, allergy, eczema, pruritus, stomatitis and emaciation	Paste and decoction
<i>Walsura trifoliata</i> (A. Juss.) Harms. (Meliaceae)	Tree	Kanjimaram	Bark	Stimulant, expectorant, emmenagogue, emetic and skin diseases	Decoction
<i>Zizyphus mauritiana</i> Lam. (Rhamnaceae)	Tree	Illandai	Fruits	Ulcers, cuts, liver trouble, asthma and fever	Decoction

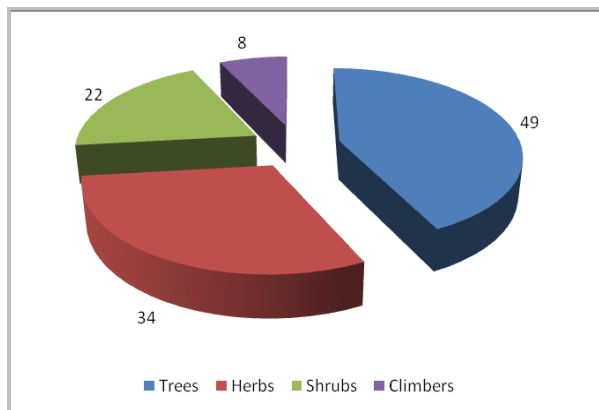


Fig. 3: Habit-wise distribution of plants of riparian vegetation of the study area.

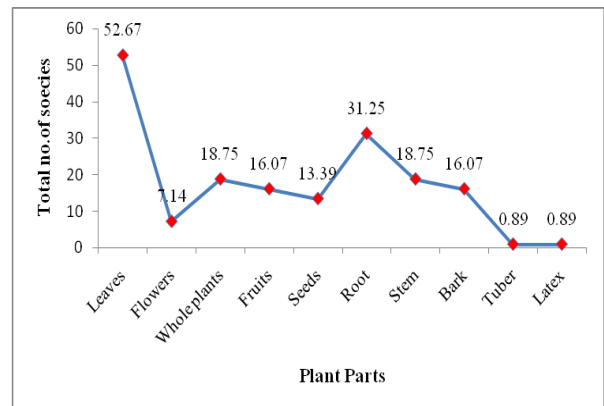


Fig. 4: Useful part-wise percentage of ethnomedicinal plants in the study area.

Conclusion

The study points out that intense biotic pressure around the river basin have made a negative impact on the original of riparian forest. The riparian vegetation found in the forest zone is very important, as it is rich in biodiversity. Conservation of riparian vegetation in this zone acts as a corridor for wildlife movement, and it also supports the livelihood means of the tribals, fisherman, and other local people. A minimum width of riparian vegetation in agroecosystem zone is very much essential to maintain the quality of river water and also for biological conservation of species. Hence, riparian vegetation lining in the forest zone should be safeguarded to a minimum width, which provides a habitat to many wildlife.

Conflict of interest statement

Authors declare that they have no conflict of interest.

References

- Aguiar, F. C. & M. T. Ferreira. 2005. Human disturbed landscapes: effects on composition and integrity of riparian woody vegetation in the Tagus River basin, Portugal. *Environmental Conservation* 32: 30-41.
- Arizmendi, M. C., P. Davila, A. Estrada & E. Figueroa. 2008. Riparian mesquite bushes are important for bird conservation in tropical arid Mexico. *Journal of Arid Environments* 72: 1146-1163.
- Barthelemy, Y., S. Patrice, Y. Salifou, M. R. Jeanne & H. Victor. 2015. Floristic diversity of *Piliostigma* associations in relation to latitudinal gradient, soil and climate variables in Burkina Faso, West Africa. *Tropical Ecology* 56: 57-76.
- Bere, T. & T. Mangadze. 2014. Diatom communities in streams draining urban areas: community structure in relation to environmental variables. *Tropical Ecology* 55: 271-281.
- Blasco, F.A., Guzman, G.Q.D. and Alejandro, G.J.D. 2014. A survey of ethnomedicinal plants in Surigao Del Sur Mountain Range, Philippines. *Int. J. Pure Appl. Biosci.*, 2(4): 166-172.
- Daniel, J. N. & N. G. Hegde. 2007. Tree-borne oilseeds in agroforestry. pp. 263-276. In: D. M. Hegde (ed.) *Proceedings of the National Seminar on Changing Global Vegetable Oils Scenario: Issues and Challenges before India*. Indian Society of Oilseeds Research, Hyderabad, India.
- Dhivya, S.M. and Kalaichelvi, K. 2015. Studies on Ethno-medicinal plants used by the Irulas tribes of Nellithurai Beat, Karamadai Range of Western Ghats, Tamil Nadu, India. *Int.J. Chemi. Pharmac. Sci.*, 3(11): 2116–2124
- Edward, P. G., K. Hucklebridge, O. Hinojosa-Huerta, L. N. Pamela & J. Pitt. 2008. Reconciling environmental and flood control goals on an arid-zone river: case study of the limitrophe region of the lower colorado river in the United States and Mexico. *Environmental Management* 41: 322-335.
- Gamble, G.S. 1915. The Flora of Presidency of Madras Vol. I & II. Adlard and Son Ltd. London.
- Gamble, G.S. and Fischer, C.E.F. 1928. The Flora of Presidency of Madras Vol. III. Adlard and Son Ltd. London.
- Goebel, P. C., B. J. Palik & K. S. Pregitzer. 2003. Plant diversity contributions of riparian areas in watersheds of the Northern Lake States, USA. *Ecological Applications* 13: 1595-1609.
- Gopal, B., U. Goel, M. Chauhan, R. Bansal & S. C. Khuman. 2002. *Regulation of Human Activities along Rivers and Lakes*. Background Document for the proposed notification on River Regulation Zone. Prepared for National River Conservation Directorate, Ministry of Environment and Forest, Government of India.
- Henry, A.N., Kumary, G.R. and Chitra, V. 1987. Flora of Tamil Nadu, India. Series I: Analysis - **Vol.II**. Botanical Survey of India, Southern circle, Coimbatore.
- Hinojosa-Huerta, O. 2006. *Birds, Water, and Salt Cedar: Strategies for Riparian Restoration in the Colorado River Delta*. Dissertation, University of Arizona, Tucson.
- Ignacimuthu, S., Ayyanar, M., SankaraSivaraman, K., 2006. Ethnobotanical investigations among tribes in Madurai District of Tamil Nadu (India). *J.Ethnobi.Ethnomedi.*, 2: 25-30.
- Jain, S.K. and Rao, R.R. 1970. Hand Book of Field field and Herbarium Methods. New Delhi.
- Kadhirvel, K., Ramya, S., Palin Sathya Sudha, T., Veera Ravi, A., Rajasekaran, C., Vanitha Selvi, R. and Jayakumararaj, R. 2010. Ethnomedicinal survey on plants used by Tribals in Chitteri. Hills. *Environ.We. Int. J. Sci. Tech.*, 5: 35-46.
- Matthew, K.M. 1982. Botany; Plants; Pictorial works; Identification; India; Tamil Nadu; Carnatic, 2: 1027.
- Naiman, R.J., Décamps, H. and Pollock, M. 1993. The role of riparian corridors in maintaining regional biodiversity, *Ecological Applications*, 3(2):

- 209-212.
- Okoegwale, E.E. and Omezezi, J.U. 2001. Some herbal preparations among the people of Isoko Clan of Delta State, Nigeria. *J. Appl. Sci.*, 4: 2350-2371.
- Pamela, L. N., P. G. Edward, O. Hinojosa-Huerta, Z. Francisco & H. Keith. 2008. Riparian vegetation dynamics and evapotranspiration for the riparian corridor in the delta of the Colorado river, Mexico: Implications for conservation and management. *Journal of Environmental Management* 88: 864-874.
- Sajib, N. H. And Uddin, S. B. 2015. Ethnomedicinal study of plants in Hathazari, Chittagong, Bangladesh. *Tropi. Agri. Sci.*, 38(2): 197-210.
- Sandhya, B., Thomas, S., Isabel, W., Shenbagarathai, R., 2006. Ethnomedicinal plants used by the Valaiyan community of Piranmalai Hills, Tamil Nadu, India – A pilot study. *African J.Traditional, Complementary and Alternative Medi.*, 3(1): 101-114.
- Scott, M. L., P. L. Nagler, E. P. Glenn, C. Valdes-Casillas, J. A. Erker, E. W. Reynolds, P. B. Shafroth, E. Eduardo Gomez-Limon & C. L. Jones. 2009. Assessing the extent and diversity of riparian ecosystems in Sonora, Mexico. *Biodiversity Conservation* 18: 247-269.
- Sharma, N. K. and Gusain, O. P. 2015. A Survey of Riparian Vegetation of River Manuni in Western Himalayan Region of India. *Int. J. Curr. Res. Biosci. Plant Biol.* 2(5): 141-147.
- Smakhtin, V. U. & M. Anputhas. 2006. *An Assessment of Environmental Flow Requirements of Indian River Basins*. IWMI Research Report N 107, Colombo, Sri Lanka.
- Sujatha, G. and Mariya Selvam. S. 2015. Ethnomedicinal survey of flora used by Chettaipatti inhabitants, Manapparai. *Asi. J. Bioche. Pharm. Res.*, 4(5): 16-31.
- Sultana, A., M. S. Hussain & D. K. Rathore. 2014. Diversity of tree vegetation of Rajasthan, India. *Tropical Ecology* 55: 403-410.
- Sunil, C., Somashekar, R. K. and Nagaraja, B. C. 2010. Riparian vegetation assessment of Cauvery River Basin of South India. *Environ. Monit. Assess.*, 170: 545–553
- Sunil, C., Somashekar, R. K. and Nagaraja, B.C. 2016. Diversity and composition of riparian vegetation across forest and agroecosystem landscapes of river Cauvery, southern India. *Tropical Ecology* 57(2): 343-354.
- Verry, E. S., J. W. Hornbeck & C. A. Dolloff. 2000. *Riparian Management in Forests of the Continental United States*. Lewis Publishers.
- Villasenor-Gomez, J. F. 2006. *Habitat Use and the Effects of Disturbance on Wintering Birds Using Riparian Habitats in Sonora, Mexico*. Dissertation, University of Montana, Missoula.
- Vyas, V., Kumar, A., Wani, S.G. and Parashar, V. 2012. Status of Riparian Buffer Zone and floodplain areas of River Narmada, India. *Int. J.Envir. Sci.*, 3(1): 659-674.

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