

# Phytogeographical Distribution of Indian Vitaceae: A Report

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**Abstract:** *Vitaceae* comprises 14 genera and 978 species distributed throughout the world. In India 10 genera and 82 species of the family is distributed mostly in the tropical, subtropical and evergreen forests. Species like *Cissus subramanyanii* Shetty and Singh and *Tetrastigma andamanicum* (King) Suess. ex Suess. are endemic to Tamil Nadu and Andaman and Nicobar islands respectively. The *Leeaceae*, earlier excluded from the family, is monogeneric with about 34 species of which c. 11 occurs in India.

**Keywords:** *Vitaceae*, *Leea*, species, monogeneric, forest

## 1. Introduction

Vitaceae comprises 14 genera and 978 species distributed throughout the world basically in Northern Hemisphere in the tropical regions (Soejima and Wen, 2006; Xiang, *et al.*, 1998; Wen, 1999; Peros *et al.*, 2011; Nie *et al.*, 2010). Genus *Vitis*, *Ampelopsis* and *Parthenocissus* are mostly restricted to the mountainous regions of the temperate zone. Most species of Vitaceae are forest plants while some are Savanna dwellers. The *Leeaceae*, earlier excluded from the family Vitaceae, is monogeneric (APG III, 2009) with about 34 species of which c. 11 occur in India (Naithani, 2000). It primarily confines in Malaysia, Indochina extending to Micronesia, Melanesia i.e., tropical and subtropical Asia, Australia and Tropical Africa.

Paleontological reports suggest that earliest seeds of Vitaceae are from the late Paleocene (Chen and Manchester, 2007). Among the seed fossils, the most common species and the highest number are represented by the genus *Vitis*. Species of *Vitis* are now commonly distributed in North America and East to South Asia, forming a disjunct distribution between these two continents (Chen and Manchester, 2007). There is no wild record from Europe except for the cultivated species, *Vitis vinifera* (Punt *et al.*, 2003) which suggest that the final disappearance of *Vitis* from Europe may have resulted from the successive climatic cooling trend during the late Cenozoic (Manchester, 1994, Wen, 1999). Despite the existence of a variety of patterns, it has been suggested that many plant taxa initially diversified in Asia and then dispersed to North America through the Bering Land Bridge (Donoghue *et al.*, 2001). Dispersal within continents appears to have been asymmetrical, mostly

westward in Eurasia but eastward in North America (Xiang & Soltis, 2001).

## 2. Material and method

The present work deals with the phyto-geographical distribution of the family Vitaceae. The species were collected from different localities of India. The major objective proposed for the present research was to document the intensive details of the collected species and to proceed the phylogenetic study. The plants were collected either in flowering or fruiting or both and the collected specimens were processed following standard herbarium techniques (Jain and Rao, 1977) and specimens have been deposited at Bhagalpur University Herbarium (BHAG).

## 3. Results and Discussion

In India 10 genera and 82 species of the family is distributed mostly in the tropical, subtropical and evergreen forests of India (Shetty and Singh, 2000). Species like *Cissus subramanyanii* Shetty and Singh and *Tetrastigma andamanicum* (King) Suess. ex Suess. are endemic to Tamil Nadu and Andaman and Nicobar islands respectively. Many species of *Ampelocissus*, *Nothocissus*, *Cissus* and *Pterisanthes* prefer lowland tropical forests. *Tetrastigma* exists in lowland forests. Species like *Leea alata* prefer dry wood lands. Others like *Leea indica*, *L. guineensis*, *L. aequata*, *L. angulata*, *L. rubra* etc. have a wide range of distribution (Wen, 2007a; Nie *et al.*, 2010). *Yua* occurs in China, India and Nepal (Li, 1990). The detailed phyto-geographical distribution of the Indian Vitaceous species is shown in Table 1(after Shetty & Singh 2000).

**Table 1:** Phyto- geographical distribution of the Indian Species of Vitaceae

S.N	Species	Distribution in India	Distribution in World
01.	<i>Ampelocissus araneosa</i> (Dalz.) Planch. ex Gam.	Evergreen forests of Western Ghats, Maharashtra, Karnataka and Tamil Nadu.	----
02.	<i>Ampelocissus barbata</i> (Wallich) Planch.	Tropical and subtropical forests, Sikkim, Uttar Pradesh (Kumaon), West Bengal Arunachal Pradesh, Nagaland, Mizoram, Tripura, Meghalaya, Andaman and Nicobar.	Bhutan, Bangladesh, Myanmar, Thailand, Laos and Vietnam
03	<i>Ampelocissus divaricata</i> (Wall. ex Law.) Planch.	Evergreen forests, Uttar Pradesh Arunachal Pradesh, Himachal Pradesh, Bihar, Odisha, Madhya Pradesh, Andhra Pradesh and Tamil Nadu	Bhutan and Indo-China
04.	<i>Ampelocissus helferi</i> (Law.) Planch.	Andaman Islands	Myanmar
05.	<i>Ampelocissus indica</i> (L.) Planch.	Evergreen forests of Western Ghats from Konkan Southwards, Karnataka, Kerala, Goa and Tamil Nadu.	Sri Lanka
06.	<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Almost throughout India in evergreen and deciduous forests.	Pakistan, Nepal and Bangladesh.
07.	<i>Ampelocissus rugosa</i> (Wall.) Planch.	Himalaya from Gharwal eastwards and Khasia hills between 1200-2500m, Uttar Pradesh, Sikkim, Arunachal Pradesh and Meghalaya	Nepal and Myanmar
08.	<i>Ampelocissus sikkimensis</i> (Law.) Planch.	Subtropical forests of eastern part between 600-1500m, Assam, West Bengal, Sikkim, Arunachal Pradesh, Mizoram and Meghalaya.	Nepal
09.	<i>Ampelocissus tomentosa</i> (Roth.) Planch.	Dry deciduous forests of Central and eastern India and hills of peninsular India upto 1500m Uttar Pradesh, Andhra Pradesh, Bihar, Odisha, West Bengal, Madhya Pradesh, Gujarat, Maharashtra, Karnataka, Kerala and Tamil Nadu.	Bangladesh and Myanmar
10.	<i>Ampelocissus whightiana</i> Shetty and Singh	Evergreen forests of Courtallum, Kannikati and Muthkar vayal up to 1000m Tamil Nadu (rare).	Sri Lanka
11.	<i>Ampelopsis glandulosa</i> (Wall.) Momuj.	Subtropical forests of Northeast India between 600- 1700m, Sikkim, Manipur and Meghalaya rare).	Nepal and Myanmar
12.	<i>Ampelopsis rubifolia</i> (Wallich.) Planch.	Assam, Mizoram and Meghalaya.	Bangladesh (Sylhet).
13.	<i>Ampelopsis japonica</i> (Thunb.) Makino	West Bengal, Sikkim, Assam, Meghalaya, Mizoram, Andaman Islands.	Myanmar, China, Japan, Korea
14.	<i>Ampelopsis vitifolia</i> (Boiss.) Planch.	Jammu and Kashmir, Himachal Pradesh.	Pakistan, Iran and Afghanistan
15.	<i>Cayratia anemonifolia</i> (Zipp. ex Miq.) Suss.	Evergreen forests between 500-1800m and Tamil Nadu.	Indonesia (Timor)
16.	<i>Cayratia geniculata</i> (Blume) Gag.	Tropical and subtropical forests between 300-1200m, Sikkim, West Bengal (Darjeeling dist.), Assam, Arunachal Pradesh and Manipur.	Bhutan, Laos, Indonesia (Java, Borneo) and Philippines
17.	<i>Cayratia japonica</i> (Thumb.) Gag.	Tropical and subtropical forests upto 1500m West Bengal, Goa, Sikkim, Arunachal Pradesh, Kerala, Assam, Nagaland, Manipur, Tripura, Mizoram, Karnataka, Tamil Nadu, Meghalaya, Andaman and Nicobar.	Nepal, Myanmar, Bhutan, Malaysia, Bangladesh, Japan, Vietnam, Korea, Cambodia, Taiwan, and Australia (Queensland).
	<i>Cayratia mollissima</i> (Wall.) Gag.	Evergreen forests of Western Ghats upto 1000m, Karnataka, Kerala, Tamil Nadu and Arunachal Pradesh.	Myanmar, Vietnam Thailand, Cambodia, and Malaysia.
aa	<i>Cayratia pedata</i> var. <i>pedata</i> (Lam.) Gag	Bihar, Odisha, West Bengal, Assam, Arunachal Pradesh, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu Andaman and Nicobar	Bangladesh, Myanmar, Thailand, Vietnam, Cambodia, Indonesia (Java), Sri Lanka and Philippines
	<i>Cayratia pedata</i> var. <i>glabra</i> Gambel.	In evergreen forests at an altitude of about 1800m, Tamil Nadu (endemic).	-----
20.	<i>Cayratia roxburghii</i> Gag.	Bihar, Kerala and Tamil Nadu	Sri Lanka
21.	<i>Cayratia tenuifolia</i> (Wight & Arn.) Gag.	Karnataka, Kerala and Tamil Nadu	Sri Lanka and Indo-China
22.	<i>Cayratia trifolia</i> (L.) Domin	Almost throughout India at lower elevations in the hills.	Pakistan, Nepal, China, Bangladesh, Myanmar, Indo-China, Malaysia and Australia.
23.	<i>Cissus adnata</i> Roxb.	West Bengal, Assam, Sikkim, Arunachal Pradesh, Manipur, Mizoram, Tripura, Meghalaya and Odisha	Sri Lanka, Nepal, Myanmar, Indonesia, Bangladesh, Indo-China, Malaysia, Philippines and Australia.
24.	<i>Cissus aristata</i> Blume	West Bengal, Assam, Sikkim, Nagaland, Mizoram, Kerala, Maharashtra, Karnataka and Tamil Nadu	Bangladesh, Malaysia, Myanmar, Sri Lanka, Indo-China, Indonesia, New-Guinea and Philippines.
25.	<i>Cissus arnottiana</i> Shetty and Singh	Andhra Pradesh, Gujarat, Kerala, Maharashtra, Karnataka and Tamil Nadu	Sri Lanka.

26.	<i>Cissus assamica</i> (Lawson) Craib	Odisha, West Bengal, Assam, Arunachal Pradesh, Sikkim, Manipur, Tripura and Meghalaya.	Nepal, Bangladesh, Myanmar, Indo-China, Malaysia, Bhutan and Philippines.
27.	<i>Cissus discolor</i> Blume.	Assam, Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Maharashtra, Kerala, Karnataka, Tamil Nadu, Andaman and Nicobar.	Nepal, Bangladesh, China, Indo-China, Malaysia, Indonesia (Java), Myanmar, and Philippines.
28.	<i>Cissus elongata</i> subsp. <i>elongata</i> Roxb.	Assam, Sikkim, Meghalaya, Andaman and Nicobar.	Bhutan and Bangladesh
	<i>Cissus elongata</i> subsp. <i>littoralis</i> (Talbot) Shetty	Maharashtra, Goa and Karnataka.	-----
29.	<i>Cissus glyptocarpa</i> Thw.	Western Ghats between 300-1100m, Karnataka, Tamil Nadu and Kerala.	Sri Lanka
30.	<i>Cissus heyeana</i> Planch.	Tamil Nadu and Kerala.	Sri Lanka
31.	<i>Cissus latifolia</i> Lam.	Goa, Karnataka, Tamil Nadu and Kerala.	Sri Lanka.
32.	<i>Cissus nodosa</i> Blume.	Andaman Islands.	Malaysia.
33.	<i>Cissus quadrangularis</i> L.	Bihar, Odessa, West Bengal, Assam, Maharashtra, Goa Andhra Pradesh, Kerala, Karnataka, Tamil Nadu, Daman and Lakshadweep islands.	Africa, Sri Lanka, Bangladesh, Indo-China, Indonesia (Java) Myanmar, and Philippines.
34.	<i>Cissus hamaderoensis</i> Radcl.-Smith.	Mostly cultivated as an ornamental plant.	Yemen.
35.	<i>Cissus rotundifolia</i> Vahl.	Almost throughout India as ornamental plant.	Grenoble, Arizona Florida, California, Minnesota, Arab, East Africa, Gorge and Zimbabwe.
36.	<i>Cissus repanda</i> Vahl.	Bihar, Uttar Pradesh, Madhya Pradesh, Odessa, West Bengal, Assam, Gujarat, Rajasthan, Goa, Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Tripura and Arunachal Pradesh.	Sri Lanka, Nepal, Bhutan, Bangladesh, Myanmar and Indo-China.
37.	<i>Cissus repens</i> Lam.	West Bengal, Sikkim, Arunachal Pradesh, Assam, Meghalaya, Odisha, Goa, Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, and Andaman and Nicobar Islands.	Nepal to Taiwan, Myanmar, Thailand, Indo-China, Malaysia and Indonesia (Java).
38.	<i>Cissus spectabilis</i> (Kurz.) Planch.	West Bengal, Sikkim (endemic).	-----
39.	<i>Cissus hastata</i> Miq.	West Bengal, Sikkim, Arunachal Pradesh, Assam, Meghalaya.	Indo-China, Thailand, South-east Asia, Australia, Malaysia, Thailand and Vietnam.
40.	<i>Cissus subramanyamii</i> Shetty and Singh	Tamil Nadu (endemic).	-----
41.	<i>Cissus trilobata</i> Lam.	Kerala, Tamil Nadu and Lakshadweep islands.	Sri Lanka.
42.	<i>Cissus vitignea</i> L.	Odisha, Maharashtra, Andhra Pradesh, Kerala, Karnataka and Tamil Nadu.	Sri Lanka
43.	<i>Cissus woodrowii</i> (Stapf. ex Cooke) Santapau.	Maharashtra	-----
44.	<i>Cyphostemma auriculatum</i> (Roxb.) Shetty and Singh.	Bihar, Uttar Pradesh, Madhya Pradesh, Odessa, West Bengal, Assam, Gujarat, Rajasthan, Maharashtra, Goa, Andhra Pradesh, Kerala and Tamil Nadu.	Bangladesh and Myanmar.
45.	<i>Cyphostemma setosum</i> (Roxb.) Alston	Dry localities in Peninsular India on dry stony hills upto 500m sometimes on black soil plains, Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu.	Sri Lanka
46.	<i>Parthenocissus semicordata</i> var. <i>semicordata</i> (Wall.) C	Himachal Pradesh, Uttar Pradesh, West Bengal, Sikkim, Meghalaya and Nagaland	Pakistan, Nepal and Bhutan.
	var. <i>roylei</i> (King) Raiz. & Sax.	Himachal Pradesh, Punjab, Uttar Pradesh, Meghalaya, Kerala, and Tamil Nadu.	Pakistan, Nepal, Bhutan, West China, Myanmar, Thailand and Malaysia
47.	<i>Parthenocissus thomsonii</i> (Lawson) Planch.	Meghalaya and Arunachal Pradesh.	Nepal and West and Central China.
48.	<i>Parthenocissus quinquefolia</i> (L.) Planch.	Cult. Sp. often in Gardens	Native of North America.
49.	<i>Parthenocissus tricuspidata</i> (Sieb. & Zucc.) Planch.	Cult. Sp. often in Gardens	Native of Japan and Central China.
50.	<i>Tetrastigma affine</i> (Gag. ex Osm) Raiz. & Sax.	Uttar Pradesh, Assam, Arunachal Pradesh, Sikkim, Meghalaya, Andaman and Nicobar	Nepal and Bangladesh.
51.	<i>Tetrastigma andamanicum</i> (King.) Suess ex Suess	Andaman and Nicobar (endemic)	-----

52.	<i>Tetrastigma angustifolium</i> (Roxb.) Roxb.	West Bengal, Assam, Meghalaya and Arunachal Pradesh.	Bangladesh, Indonesia (Sumatra) and China (Hongkong).
53.	<i>Tetrastigma bracteolatum</i> (Wallich.) Planch.	Bihar, Assam, Sikkim, Meghalaya, Manipur, West Bengal, Arunachal Pradesh	Nepal, Bhutan, Bangladesh.
54.	<i>Tetrastigma campylocarpum</i> (Kurz.) Planch.	Uttar Pradesh, Bihar, Assam, Sikkim, West Bengal, Mizoram Andaman and Nicobar.	Bangladesh, Myanmar and China (Yunnan).
55.	<i>Tetrastigma dubuim</i> (Law.) Planch.	Assam, Sikkim, Mizoram, Manipur, Tripura, West Bengal, Arunachal Pradesh and Meghalaya	Nepal, Bangladesh, Myanmar and China.
56.	<i>Tetrastigma gamblei</i> Shetty and Singh	Maharashtra, Karnataka and Kerala	-----
57.	<i>Tetrastigma hookeri</i> (Lawson) Planch.	Assam and Sikkim	Nepal, Bhutan, Bangladesh, Malaysia and Indonesia (Java).
58.	<i>Tetrastigma leucotaphyllum</i> (Denn.) Als. ex Mab.	Assam, Meghalaya, Karnataka Tamil Nadu Odessa, Andhra Pradesh and Kerala	Nepal, Bhutan and Bangladesh
59.	<i>Tetrastigma nilagiricum</i> (Miq.) Shetty	Karnataka Tamil Nadu and Kerala	Sri Lanka
60.	<i>Tetrastigma obovatum</i> Gag.	Sikkim, Arunachal Pradesh, Nagaland and Meghalaya	Bhutan, Bangladesh and Myanmar.
61.	<i>Tetrastigma obtectum</i> (Wall. ex Law.) Planch. ex Franch.	Uttar Pradesh, Sikkim, Arunachal Pradesh and Manipur	Nepal, Bhutan and China (Yunnan).
62.	<i>Tetrastigma planicule</i> (Hook. f.) Gag.	Sikkim, Arunachal Pradesh Assam and Meghalaya	Laos, Sri Lanka, Vietnam
63.	<i>Tetrastigma rumicispermum</i> (Lawson) Planch.	Assam, Sikkim, West Bengal, Arunachal Pradesh and Meghalaya	Nepal, Bhutan, Myanmar, Vietnam, Laos and Malaysia.
64.	<i>Tetrastigma serrulatum</i> (Roxb.) Planch.	Himachal Pradesh, Uttar Pradesh, Assam, Sikkim, Arunachal Pradesh and Meghalaya	Nepal, Bhutan, Bangladesh, China (Yunnan) and Thailand.
65.	<i>Tetrastigma sulcatum</i> (Lawson) Gam.	Goa, Andhra Pradesh, Kerala, Karnataka and Tamil Nadu	-----
66.	<i>Vitis flexuosa</i> var. <i>parvifolia</i> (Roxb.) Gag.	Kashmir, Himachal Pradesh, Uttar Pradesh, West Bengal, Assam and Manipur.	Pakistan, Nepal, China.
67.	<i>Vitis heyneana</i> Roemer and Schult.	Himachal Pradesh West Bengal, Assam, Sikkim, Andhra Pradesh, and Meghalaya	Nepal, Bhutan, West China and Myanmar.
68.	<i>Vitis labrusca</i> L.	Cultivated in Certain Parts of India.	Pakistan and Nepal.
69.	<i>Vitis Jacquemontii</i> R. Parker	Himachal Pradesh and Uttar Pradesh.	Native of Europe.
70.	<i>Vitis vinifera</i> L.	Cultivated in Certain Parts of India.	Native of W. Asia.
71.	<i>Leea aequata</i> L.	Uttar Pradesh, Bihar, West Bengal, Sikkim, Assam, Arunachal Pradesh, Odisha, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, and Andaman islands.	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Cambodia, Thailand, Malaysia, Singapore, Laos, Indonesia and Philippines.
72.	<i>Leea alata</i> Edgew.	Gangetic plains, eastern and central India, ascending upto 1500 m in the Himalaya. Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, Sikkim, Assam, Arunachal Pradesh, Meghalaya, Odisha and Madhya Pradesh.	Nepal and Bhutan.
73.	<i>Leea angulata</i> Korth. Ex Miq.	Coastal belts, Nicobar Islands.	Peninsular Thailand, Malaysia, Singapore, Indonesia and Philippines.
74.	<i>Leea compactiflora</i> Kurz.	Evergreen forest up to 2000m, Uttar Pradesh (Terai), West Bengal, Sikkim, Arunachal Pradesh, Nagaland, Assam, Manipur, Mizoram and Meghalaya.	Bhutan, Bangladesh, Myanmar, Laos, North Vietnam, and China.
75.	<i>Leea grandifolia</i> Kurz.	Coastal Areas, Andaman and Nicobar Islands.	-----
76.	<i>Leea asiatica</i> (L.) Ridsdale	Evergreen, deciduous and lower mountain forests, up to 2250m in the Himalaya, Uttar Pradesh, grasslands in the plains, Jammu and Kashmir, Himachal Pradesh, Madhya Pradesh, Bihar, West Bengal, Sikkim, Tamil Nadu, Kerala, Arunachal Pradesh, Assam, Odisha, Nagaland, Manipur, Mizoram, Andhra Pradesh, Meghalaya, Rajasthan, Bihar, Deccan (Sandur hills) Maharashtra, Karnataka, and Andaman Islands.	Nepal, Laos, Bhutan, Madagascar, Myanmar, Bangladesh, Vietnam, Thailand and China.
77.	<i>Leea guineensis</i> G. Don.	Uttar Pradesh, Sikkim, Assam, Manipur, Tamil Nadu, Meghalaya, Maharashtra and Andaman Islands.	Myanmar, Thailand, Laos, Taiwan, Bourbon Malaysia, Indonesia, New Guinea, Central West and East Africa, Micronesia, Mauritius. Philippines and Tropical Madagascar.

78.	<i>Leea indica</i> (Burm.f.) Merr.	Punjab, Uttar Pradesh, Bihar, West Bengal, Sikkim, Arunachal Pradesh, Assam, Goa, Nagaland, Mizoram, Tripura, Madhya Pradesh, Meghalaya, Odisha, Maharashtra, Andhra Pradesh, Tamil Nadu, Kerala and Andaman & Nicobar Islands.	Sri Lanka, Nepal, Bangladesh, Fiji, Myanmar, Singapore, Indonesia, New Guinea, Philippines, Laos, Vietnam, Cambodia, Thailand, China, Malaysia, N. Australia, Solomon Island and Santa Cruz Island.
79.	<i>Leea macrophylla</i> Roxb. ex Hornem.	Sub Himalayan tract upto 2250m and Western Ghats, Uttar Pradesh, Bihar, West Bengal, Sikkim, Assam, Meghalaya, Odisha, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Kerala and Andaman island.	Nepal, Bhutan, Bangladesh, up to 2250m Myanmar, Laos, Cambodia and Thailand.
80.	<i>Leea setuligera</i> Clarke	Assam, Maharashtra (Khandala) and Karnataka (Concan).	Thailand and China .
81.	<i>Leea rubra</i> Blume ex Spreng.	West Bengal, Assam and Meghalaya.	Bangladesh, Myanmar, Thailand, Vietnam, Cambodia, Malaysia, Philippines, Laos, New Guinea and North Australia
82.	<i>Yua thomsonii</i> Li	Assam	Nepal, China.

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