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Taxonomical diversity of Vitaceae in Andaman and Nicobar Islands, India

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Abstract

The most important tendril bearing climber family is Vitaceae. The present investigation tends to highlight some shadowed angles of Vitacean members which are the dominant part of forest community in Andaman region. Each climber was analyzed with respect to their habit, habitat and distribution, seedling growth, climbing mechanism, way of host approach, association and the overall role in the forest community. The present survey enumerates 4 genera and 13 species and provided baseline data on distribution of different species of Vitaceae in Andaman and Nicobar Islands which may help in finding out the species / varieties or races for agricultural planning and other related activities in the Union territory.

Key-Words: Vitaceae, Distribution, Andaman and Nicobar Islands

Introduction

Vitaceae is one of the most dominant and diversified families of climbing plants distributed throughout the tropical forests including India. According to the study of Hui *et al.* (2011), the family exhibit interesting geographical distribution patterns, some genera are strictly regional, some are endemic and some are worldwide. Acevedo-Rodrigues (2005) described throughout families of climbing plants and assessed their resemblances; Vitaceae is one of the primitive families of angiosperms and may evolve into Asclepidaceae.

Lambordi (1997) focused on the nomenclature system given to the Vitaceae members. Wilson *et al.* (2006) investigate the morphological and anatomical development in family Vitaceae. Their work reveals that some species of vitaceae shows important vegetative and reproductive differences among species. In India, Chitubabu and Parthasarathy (2001), Reddy and Parthasarthy (2003), Rawal and Pangtey (1991), Parthasarathy *et al.* (2008) prepared the preliminary list, patterns of diversity and phenology of climbing plants from different ecological zones. Ghosh and Mukherjee (2006), Ghosh (2013, 2014, 2014a, 2014b), Ghosh and Panday (2014) investigated the community ecological studies of climbing plants in Andaman and Nicobar Islands. But no comprehensive taxonomical study of Vitaceae in Andaman Islands is yet to be accomplished.

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Material and Methods

The Andaman and Nicobar islands, a landmass of 572 islands, isles, rocks and reefs, about 1200 km from the mainland India, is located between the latitude of 6° to 14° N and longitude of 92° to 94° E, covering an area of 8249 km^2 and it covers South, Middle, North, Little Andaman and Nicobar Islands.

The present work is the outcome of extensive field survey during 2001-2004, carried out to document the species occurring in different parts of Andaman and Nicobar Islands. The collected specimens were processed into mounted herbarium sheets following standard herbarium techniques (Jain & Rao, 1977). Specimens were identified with the help of literature (Hooker, 1872-1885; Gamble & Fisher, 1921-1935; Perkinson, 1923; Rao & Verma, 1973; Mathew, 1991) and subsequently confirmed by consulting the specimens deposited in the Central National Herbarium (CNH). The voucher specimens were deposited in the Herbarium of the Department of Botany, Calcutta University (CUH). Distributional status of the identified species in the world and India were recorded from literature.

Results and Discussion

Taxonomy, ecology and distributional status of Vitaceae in Andaman and Nicobar Islands

About 14 genera and 900 species: worldwide, but mostly in the tropical or subtropical regions; 4 genera and 13 species (2 endemic) in Andaman & Nicobar Islands.

1. a. Tendrils inflorescence-borne ……...1.*Ampelocissus*.
b. Tendrils leaf-opposed…… ……...2
2. a. Flowers unisexual; stigma usually 4-lobed……....4. *Tetrastigma*
b. Flowers bisexual; stigma entire…….3
3. a. Leaves simple or digitately 5-foliolate; berries 1-2 seeded……..……..3. *Cissus*
b. Leaves palmately compound; berries 2-4 seeded……..2. *Cayratia*

1. *Ampelocissus* Planch. (nom. Cons.)
Ampelocissus barbata **(**Wall.) Planch. in DC., Monogr. Phan. 5: 375. 1887. *Vitis barbata* Wall. in Roxb., Fl. Ind. 2: 478. 1824; Laws in Hook. F. Fl. Brit. India 1: 651. 1875; Parkinson, For. Fl. Andaman Islands. 134. 1923.
Lianas; branchlets terete, slightly flattened at nodes, hollow, ribbed. Leaves, simple, ovate, up to 27 x 24 cm, acuminate at apex, cordate at base, unequally wavy dentate; lateral nerves 6-7 pairs, thinly coraceous; petioles wooly tomentose intermixed with bristles. Panicled cymes up to 12 cm long. Flowers pedicilate, yellow or yellowish-green, 2 mm long. Calyx copular, obscurely lobed. Petals spreading or slightly recurved. Disc annular, often 5-10 furrowed. Stamens inserted around disc. Ovary 2-celled, ovles 2 per ecll, style short, thick, stigma discoid. Berry, globose, 7 mm across, ripening brownish-green, red or dark purple. Seed 2, dorsally compressed.
Flower & Fruit: May-September.
Ecology: Common, growing along edges and roadsides inland forest, loose soil and also seen occasionally in Mangrove forests, it climbs up bamboo fencing and associated climber is *Dioscorea sp*.
World distribution: India and Bangladesh.
Andaman Islands: Andaman group of Islands and North and South Nicobar.
Specimen examined: N. Andaman: Ganeshnagar (17.12.2003) *A. Ghosh*.786 (CUH).

2. *Cayratia* A. L. Juss. (nom. Cons.)
Vines or lianas. Stipules 2, distinct. Cymes corymbose. Flowers 4-merous. Calyx subtruncate, obscurely lobed. Petals corniculate, cucullate within. Disc copular, adnate to base of ovary. Stamens inserted around disc. Ovary 2-celled, ovules 2 per cell, style subulate. Seeds pitted.
About 45 species distributed in Africa, Madagascar, Indo-Malaysia, Australia, New Caledonia and Pacific; 3 species in Andaman & Nicobar Islands.

1. a. Leaves all digitately 3-foliolate……..3. *C. trifolia*
b. Leaves pedately 3-5 foliolate, rarely up to 11-foliolate……...2
2. a. Branchelets glabrous; leaflets ovate or oblanceolate; peduncles not articulate; cymes usually leaf-opposed; seeds pyriform……..1. *C. japonica*
Branchlets pilose when young, later becoming glabrous; leaflets oblong-lanceolate, Ovate-oblong or rarely obovate; peduncles mostly articulate; cymes axillary; seeds hemispheric……..…2. *C. pedata*

1. *Cayratia japonica* (Thunb.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 349. 1911; Backer & Bakh. F., Fl. Java 2: 93. 1965. *Vitis japonica* Thunb., Jap. 104. 1784; Parkinson, For. Fl. Andaman Islands. 134. 1923. *V. tenuifolia* auct. Non Wight & Arn. 1834; Laws. in Hook. f. Fl. Brit. India 1: 600. 1875 p.p.
Climbers; stems grayish to whitish, slender, branchlets slightly swollen at nodes, terete, hollow, finely ribbed, glabrous. Leaves 3-5 foliolate; leaflets ovate or oblanceolate, up to 12 x 6.3 cm, acuminate or rarely acute at apex, cuneate, oblique or alternate at base, serrate. Panicled cymes usually leaf-opposed, peduncles not articulate, up to 13 cm across, puberulous. Flowers white on greenish, 1.2 mm long. Berry, globose, 1.2 cm across. Seeds pyriform, pitted.
Flower & Fruit: May-March.
Ecology: Common, growing along edges and roadsides inland forest, loose soil and also seen occasionally in Mangrove forests, it climbs up bamboo fencing and associated climber is *sp*.
World distribution: India and Bangladesh.
Andaman Islands: Andaman group of Islands and North and South Nicobar.
Specimen examined: N. Andaman: (22.12.2004) *A. Ghosh*.809 (CUH).

2. *Cayratia pedata* *(Lamk.) Juss. Ex Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 346. 1911; Shetty & P. Singh in Kew Bull. 42: 935. 1987 & in Taxon 37: 171. 1988.* Cissus pedata *Lamk. Encyl. 1: 31. 1783.* Vitis pedata *(Lamk.) Wall. ex Wight, Cat. 26. 1833; Laws. in Hook. f. Fl. Brit. India 1: 661. 1875; Kurz in J. As. Soc. Bengal 45(3): 124. 1876.*
Lianas; branchlets terete, hollow, ribbed, stems grayish to pale pinkish-brown, slender, slightly swollen at nodes, pillose when young, later becoming glabrous. Leaves pedately 5 lobed, inequilateral, rarely 3-11 foliolate; leaflets membranaous, oblong-lanceolate or rarely obovate, up to 15 x 8 cm, acuminate at apex, oblique and unequal at base, remotely serrate-toothed,

5-6 secondary nerves, craspedromous, membranous, pubescent; petiole 5-9 cm, pubescent; petiolule 0.5-1.5 cm; stiples linear, 4-5 mm. Tendril leaf opposite, forked. Corymbose cymes axillary, divarcate, 2-3 cm, pubescent; peduncles mostly articulate 2-5 cm; bracteole 1 mm, pedicel 4-6 mm. Flowers tetramerous, 3 mm across, green- greenish pubescent. Calyx tube 1 mm, 4-lobed, lobes rotund, 0.5 mm. Corolla ovate, 2 mm, green. Disc 4 lobed, 1 mm, crenulate at the rim. Stamens filaments 1 mm. Ovary 1 mm, 2 celled, 2 ovules per cell; style simple, 1.5 mm; stigma indistinct. Berry, depressed-globose, obscurely 4-lobed, 1cm across, smooth, ripening violet. Seeds 4, obcordate, 0.5 mm diameter, hemispheric pyrriform, glabrous.

Flower: April-July.

Fruit: Throughout the year.

Ecology: Common, growing on loose clay soil, found inland evergreen forest, it climbs up *Mangifera andamanica, Diospyrous oocarpa, Pterospermum sp. Sageraea elliptica and associated climber are Tinospore cordifolia, Smilax sp., Strychnos acuminata, Clematis smilacifolia Tetracera sarmentosa*.

World distribution: India, Sri Lanka, Malaysia, and Singapore.

Andaman Islands: Andaman group of Islands and North Nicobar.

Specimen examined: N. Andaman: Lamiabay (05.11.2001) *A. Ghosh* 41(CUH).

Ramkrishnagram (25.11.2004) *A. Ghosh* 63 (CUH).

3. *Cayratia trifolia* *(L.) Domin in Biblioth. Bot. 89: 370. 1927; Shetty & P. Singh in Taxon 37: 171. 1988.* Vitis trifolia *L., Sp. Pl. 203. 1753.* V. carnosa *(Lam.) Wall. Num. List. 206, No. 6018. 1831-32; Laws. in Hook. f. Fl. Brit. India 1: 654. 1875*

Climbers; branchlets terete to angled, faintly ribbed, stems solid, grayish-black, pubescent. Leaves all digitately 3-foliolate, up to 22.5 cm long; leaflets membranaous, obovate to elliptic on rarely rhomboid to almost orbicular, up to 13.5 x 5.2cm, obtuse or acute, rarely acuminate at apex, cuneate, rounded or slightly oblique at base, serrate or dentate-toothed, 5-6 pairs secondary nerves, craspedodromous, pubescent; petiole 5-7 cm, pubescent; petiolule 2-3 mm; stipules 2, triangular, 3-4 mm. Tendrils opposite the leaves, slender, wiry, usually branched. Cymes axillary umbellate or corymbose, 3.5-4 cm; peduncle 10-12 cm, articulate; bracteole orbicular, 0.5 mm; pedicel 1-1.5 mm. Flowers greenish-white, 5 mm across. Sepals tube 0.5 mm, pubescent. Petals lobes obovate, 1.5 mm, greenish-white, pubescent. Disc obscurely lobed, apically crenulate. Stamens filaments 1 mm. Style simple, 1.5 mm; stigma capitate. Berry, turbinate or globose, up to 1.1 cm across, turbinate, fleshy, ripening black or violet. Seeds 2, hemispheric, 6 x 4 mm, compressed, pitted.

Flower & Fruit: Throughout the year.

Ecology: Common, evergreen, growing inland forest, loose soil and also seen occasionally in littoral forests, it climbs up *Pterospermum sp, Diospyros oocarpa* and associated climber are *Cissus pentagona, Calamus sp*.

World distribution: Tropical India, Bangladesh, Sri Lanka, and China.

Andaman Islands: Andaman group of Islands.

Specimen examined: Andaman: Lamia Bay (6.11.2001) *A. Ghosh*. 23 (CUH).

3. *Cissus* L.

Climbers or sometimes-creeping herbs. Cymes leaf-opposed or placed next the leaves, umbellate. Flowers 4-merous, bisexual. Calyx-tube copular, entire or obscurely 4-lobed. Petals ovate, calyptrate at first, afterwards separate. Disc copular, basally enveloping ovary. Ovary 2-celled, ovules 2 per cell, style subulate, stigma small. Berries fleshy.

About 350 species in tropical, rarely in subtropical; 4 species in Andaman & Nicobar Islands.

1. a. Leaves compound, digitately 5-foliolate……..……2
   b. Leaves simple……..….3
2. a. Leaves up to 9.5 x 4 cm; seed 1.3 cm across……....2. *C. elongata.*
   b. Leaves up to 8.5 x 2.5 cm; seed 1 cm across……..3. *C. pentagona.*
3. a. Leaves ovate to oblong, up to 10.5-14.5 x 4-6.5 cm; seed 7-8 x 2.5-3 mm across ……...4. *C. repens*.
   b. Leaves ovate-lanceolate to lanceolate or ovate-oblong, up to 20 x 6.5 cm; fruits 6.3 mm across……1. *C. discolor.*

1. *Cissus discolor* *Bl., Cat. Gew. Buitenz. 39. 1823 & Bijdr. 181. 1825; Latiff in Malay. Nat. J. 35. 205. 1982.* Vitis discolor *Dalz. in Hook. J. Bot. Kew Gard. Misc. 2: 38. 1850; Laws. in Hook. f. Fl. Brit. India 1: 647. 1875; Parkinson, For. Fl. Andaman Islands. 133. 1923.*

Climbers, stems woody at base, terete, red when young, branchlets pinkish-brown or pale yellowish. Leaves simple, membranous, variegated, ovate-lanceolate to lanceolate or ovate-oblong, up to 20 x 6.5 cm, acuminate at apex, cuneate, rounded or truncate or cordate at base, bristly serrate; lateral nerves 5-7 pairs, glabrous. Cymes leaf-opposed, umbellate, up to 6 cm long. Flowers 4-merous, bisexual, 3 mm long. Calyx-

tube copular, entire or obscurely 4-lobed, with unequal sides, purpel. Petals ovate, calyptrate at first, afterwards separate, yellow. Disc copular, basally enveloping ovary. Ovary 2-celled, ovules 2 per cell, style subulate, stigma small. Berry, globose, 6.3 mm across, fleshy, ripens red. Seeds 1, globosely pyriform, 0.45 cm, with angular facts, pale, glabrous.
Flower: August-December.
Fruit: November-March.
Ecology: Common, growing inland forest, loose blackish soil and also seen occasionally in roadside, it climbs up bamboo fencing and associated climber is *Dioscorea bulbifera.*
World distribution: India and Bangladesh.
Andaman Island: Andaman group of Islands.
Specimen examined: N. Andaman: Kalpong area (12.10.2003) *A. Ghosh*.628 (CUH).

2. *Cissus elongata* *Roxb., Fl, Ind. 1 : 429. 1820; Shetty & P. Singh in Taxon 35: 596. 1986.* Vitis elongata *(Roxb.) Wall. Num. List. 206, No. 6016. 1831-32; Laws. in Hook. f. Fl. Brit. India 1: 658. 1875.*
Climbers, branchlets terete, hollow, striate, dull grayish-white or grayish-black. Leaves, compound, digitately 5-foliolate, 9 cm long; leaflets membranous, oblanceolate or rarely obliquely lanceolate, up to 9.5 x 4 cm, acuminate at apex, cuneate, or slightly alternate at base, broadly serrate. Cymes leaf-opposed, umbellate, up to 12 cm long.. Flowers 4-merous, bisexual, 2.5 mm long, greenish-purpel. Calyx-tube copular, entire or obscurely 4-lobed, purpel. Petals ovate, calyptrate at first, afterwards separate. Disc copular, basally enveloping ovary. Ovary 2-celled, ovules 2 per cell, style subulate, stigma small. Berry, globose, 2.3 mm across, fleshy, ripens red. Seed 1.3 cm across, stony with a beak at one end.
Flower: March-June.
Fruit: August-December.
Ecology: Common, growing along side of the forest path, loose blackish loose soil and also seen occasionally in roadside, it climbs up bamboo fencing and associated climber is *Ipomoea sp*.
World distribution: Bangladesh and India.
Andaman Islands: Andaman group of Islands.
Specimen examined: N. Andaman: Shyamnagar (14.11.2003) *A. Ghosh*.602 (CUH).

3. *Cissus pentagona* *Roxb., Fl, Ind. 1 : 408. 1820.* Vitis pentagona *Voigt, Hort. Suburb. Calc. 28. 1845; Laws. in Hook. f. Fl. Brit. India 1: 646. 1875; Kurz, For. Fl. Brit. Burma 1: 275.1877.*
Climbers, branches pale yellowish, brownish to brownish-green, thick, succulent, glossy. Leaves 7.5 cm long; leaflets membranous, oblanceolate or rarely obliquely lanceolate, up to 8.5 x 2.5 cm, acuminate at apex, cuneate, or slightly alternate at base, broadly serrate. Cymes leaf-opposed, umbellate, up to 10 cm long. Flowers 4-merous, bisexual, 2 mm long, greenish-purpel. Calyx-tube copular, entire or obscurely 4-lobed, purpel. Petals ovate, calyptrate at first, afterwards separate. Disc copular, basally enveloping ovary. Ovary 2-celled, ovules 2 per cell, style subulate, stigma small. Berry, globose, 2 mm across, fleshy, ripens red. Seed 1 cm across, stony with a beak at one end.
Flower: March-June.
Fruit: August-November.
Ecology: Common, growing along side of the forest path, loose blackish loose soil and also seen occasionally in roadside, it climbs up bamboo fencing and associated climber is *Dinochloa sp*.
World distribution: India and Bangladesh.
Andaman Islands: Andaman group of Islands.
Specimen examined: N. Andaman: Austin 2 (19.11.2003) *A. Ghosh*.635 (CUH).

4. *Cissus repens* *Lam., Encycl. 1: 31. 1783; Shetty & P. Singh in Taxon 37: 173. 1988.* Vitis repens *(Lam.) Wight & Arn. In Wight, Cat. 58. 1833 & Prodr. 125. 1834; Laws. in Hook. f. Fl. Brit. India 1: 646. 1875; Parkinson, For. Fl. Andaman Islands. 134. 1923.*
Large climbers, branchlets cylindric weak fleshy, grayish, glaucous, ribbed, glabrescent. Tendrils, slender, fleshy, bifid. Leaves alternate, simple, ovate-oblong, up to 10.5-14.5 x 4-6.5 cm, base cordate, acuminate at apex, margin crenate-serrate, 6 pairs secondary nerves, 2 pair from the base, actinodromous, membraneous, green, glabrous; petiole 4-6.5 cm, glabrescent. Cymes leaf-opposed, compound umbellate, up to 4.5 cm long; peduncle 3-4 cm; bracts and bracteoles 1.5 cm; pedicle 0.4-1 cm. Flowers 4-merous, bisexual, greenish-yellow, 4 mm across. Calyx-tube copular, 0.8 mm, 4-lobed, triangular, 0.5 mm, obtuse, with equal sides, purple, glabrous. Petals ovate, 1.5 mm, calyptrate at first, afterwards separate, greenish-yellow. Disc 4 lobed, copular, basally enveloping ovary. Stamens filaments 1.5 mm, anthers oblong. Ovary 1 mm, 2-celled, ovules 2 per cell; style 1, subulate, 0.8; stigma small. Berry, globose, 7-8 x 2.5-3 mm across, fleshy, black when ripe, glabrous. Seeds solitary, pyriform, with angular facts, glabrous.
Flower: July-August.
Fruit: September-November.
Ecology: Not frequent, found in deep forest, growing in shady clay soil and also seen artificially created forest path, it climbs up *Planconia andamanica*,

Artocarpus lakoocha and associated climber is *Tinospora sp, Smilax sp*.
World distribution: India, Bangladesh and Malaysia.
Andaman Islands: North Andaman Islands.
Specimen examined: N. Andaman: Mohanpur (12. 11. 2001) *A. Ghosh*.17 (CUH).
Diglipur (10. 11. 2003) *A. Ghosh*.702 (CUH).

4. *Tetrastigma* (Miquel) Planchon in A. Candolle & C. Candolle, Monogr. Phan. 5: 320, 423. 1887.
Climbers, woody, rarely herbaceous, usually polygamo-dioecious. Tendrils unbranched or bifurcate, sometimes palmately branched. Leaves usually palmately 3–5-foliolate or pedately 5–7-foliolate, rarely simple. Inflorescence a polychasium, an umbel, or a compound cyme. Flowers 4-merous. Petals spreading, free, usually hooded or galeate, sometimes corniculate. Stamens short, abortive in female flowers. Disk well developed in male flowers, inconspicuous in female flowers. Style conspicuous or inconspicuous; stigma usually 4-divided, rarely irregularly divided. Berry globose, ellipsoid, or obovoid, 1–4-seeded. Seed elliptic, obovoid-elliptic, or obtriangular, abaxial surface with a linear to orbicular chalazal knot, adaxial surface with a linear raphe; cross-section of endosperm T- or M-shaped.
Liana. Leaves palmately 1-3 foliolate or pedately 4-6 foliolate; tendrils entire on bifid. Inflorescences axillary or leaf-opposed cymes. Flowers 4-merous. Calyx lobed, dentate or truncate. Petals free. Disc thick, persistent in fruit. Stamens inserted under disc, staminodes minute. Ovary embedded in disc, 2-celled, celled 2-ovuled, styles short. Berries 1-4 seeded.
About 90 species, distributed in S. E. Asia, Indo-Malaya and Australia; 5 species in Andaman and Nicobar Islands.

1. a. Seed 1……..1. *T. andamanicum*
   b. Seed 1-many (2-4)…… 2.
2. a. Branch glabrous……...3
   b. Branch browny tomentose…… ……...4.
3. a. Leaflets ovate-subovate, 3.5-8 x 2-4 cm; 9-10 secondary nerves; pedicel 0.5-1 cm..
   ……..…5.*T. serrulatum*
   b. Leaflets elliptic-lanceolate, ovate-lanceolate, 9-16 x 6-7 cm; 5-6 secondary nerves; pedicel 3-10 mm…….4. *T. panicaule*
4. a. Petiole 2.5-4.5 cm; vein thick-coriaceous……3. *T. leucostaphyllum*
   b. Petiole 5-8 cm; vein thin-coriaceous……..…..…2. *T. lanceolarium*

1. *Tetrastigma andamanicum* (King) Suesseng. In Engl. & Prantl, Nat. Pflanzenfem. Ed. 2, 20 d: 319. 1953. *Vitis andamanicum* King in J. As. Bengal 65: 393. 1896; Brandis, Ind. Trees. 1906; Parkinson, For. Fl. Andaman Islands. 134. 1923.
Lianas; matures branches woody, young branches striate, terete, black or dark. Leaves mostly 3-foliolate or pedately 4-5 foliolate; leaflets thinly coriaceous, oblong to elliptic or ovate, up to 19 x 10 cm, shortly cuspidate or acuminate at apex, cuneate or rarely slightly oblique at base, broadly serrate; lateral nerves 6-12 pairs. Cymes axillary, 3.5 x 4.6 cm, many flowered, much branched, spreading, puberulous, pedunclate. Flowers 2 mm long. Berry, globular-ovoid, 2 x 2 cm, green with a scanty pulp. Seed 1, ovoid, 10 x 7 mm, subcomposed, groved on one face and 3-ridges on the other.
Flower: January-May.
Fruit: July-September.
Ecology: Common, growing along roadsides in loose soil, also found in edges of secondary forests, it climbs up bamboo fencing and associated climber is *Dioscorea sp*.
World distribution: India, Bangladesh, Cambodia, Laos, Myanmar, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines Thailand, Vietnam and China.
Andaman Islands: Andaman group of Islands and North and South Nicobar.
Specimen examined: N. Andaman: Ramnagar (20.12.2002) *A. Ghosh*.304 (CUH).

2. *Tetrastigma lanceolarium* (Roxb.) Planchon in A. & C. DC. Monogr. Phan. 5:423, 1887; Gamble, Fl. Madras 1: 288 (164). 1918. *Vitis lanceolaria* Roxb. Fl. Ind. 1: 412. 1832; Wight & Ann. Prodr. fl. Ind. orient. 128. 1834; Wight, Icon. pl. Ind. orient. T. 177. 1839; Hook. f. Fl. Brit. India.1: 660.1875; Anon.Draw. Ind. pl. (Icon. Roxb. No. 2429) 3: t. 11. 1969.
Large tendril climber; branchelets rounded, browny glabrescent. Leaves alternate, 3-5 foliolate, 8-17 cm; leaflets oblanceolate-elliptic, 8-11 x 2.5-4.5 cm, base subacute-cuneate, apex caudate, margin serrates, lateral nerves 7 pairs, brochidromous, thin-coriaceous, glabrous; petiole 5-8 cm, glabreacent; petiolule 1.5 cm, pubescent; tendril leaf opposed, simple, stout, glabrescent. Male flower: cymes panicled, 5 cm, pubescent; peduncle 2 cm; bracteole suborbicular, 2 mm; pedicel 1.5-4.5 mm; flower 5 mm across. Calyx tube 4-lobed, copular, 0.5 mm, pubescent. Petals 4, oblong-lanceolate, 3 mm, greenish white muconate. Disc lobed. Stamens 4, filaments 2 mm, glabrous. Female flowers: cymes, corymbose, 2 cm; peduncle 1.5

cm; pedicel 2.5 mm. Flowers 4.5 mm across, yellowish-white; staminodes 4, 0.5 mm. Ovary subglobose, angular, 2-celled, 1 mm, glabrous, 2 ovules in each cell; style short, 1 mm, glabrous; stigma 4-lobed, subsessile, glabrous. Berry, globose, 1 x 0.8, succulent, light green, glabrous. Seed 2, oblong, 2-4 mm, glabrous.

Flower: March -April.

Fruit: June-August.

Ecology: Common, found in roadside, open secondary forest, growing on rocky substratum, stem little tuberculate, brown soil, 30% slope; it climbs up and forming canopy over *Planchonia andamanica, Canarium euphyllum* and associated climber are *Raphidophora sp, Calamus viminalis, Dinochloa andamanica.*

World distribution: India, Sri Lanka and Malaysia.

Andaman Islands: Andaman group of Islands.

Specimen examined: N. Andaman: Radhanagar Despensari (06.11.2001) *A. Ghosh*.01(CUH).
Gandhinagar (13.11.2001) *A. Ghosh*.93 (CUH).
Subashgram (21.12.2002) *A. Ghosh*.513 (CUH).

3. *Tetrastigma leucostaphyllum* (Dennst.) Alston ex Mabb. Taxon 26: 539. 1977; Matthew Ill. Fl. Tamilnadu carnatic t. 159. 1982. *Cissus leucostaphyllum* Dennst. Schlussel Hortus malab. 17, 19, 33. 1818 & in Fortsetz. Allg. Tentsch. Gart.-Mag. 3: 35, 37, 81. 1818. *Tetrastigma muricatum* (Wight & Ann.) Gamble, Fl. Madras 1: 229 (164). 1918; Matthew Mat. Fl. Tamilnadu carnatic 176. 1981.

Large tendril climber; branchelets tuberculate, browny tomentose. Leaves alternate, 5-foliolate, 4-15 cm; leaflets oblanceolate, 4-12 x 2-5 cm, base cuneate, apex abruptly acute, margin distantly serrulate or subcrenate, lateral nerves 7-9, brochidromous, thick-coriaceous, glabrous; petiole 2.5-4.5 cm, pubescent; petiolule 0.4-1 cm, pubescent; tendril leaf opposed, simple, glabrescent. Male flower: cymes panicled, 1.5-2 cm, pubescent; peduncle 1.5 cm; bracteole suborbicular, 1 mm; flower 4 mm across. Calyx tube 4-lobed, 1 mm, pubescent. Petals 4, ovate, 1.5 mm, green. Disc lobed. Stamens 4, filaments 1 mm, glabrous. Female flowers: cymes, corymbose, 2 cm; peduncle 1 mm. Flowers 3 mm across; staminodes 4, 1 mm. Ovary subglobose, 2-celled, 1 mm, glabrous, 2 ovules in each cell; style short, 1 mm, glabrous; stigma 4-lobed, glabrous. Berry, globose, 1 x 0.8, succulent, glabrous. Seed 2-4, oblong, 2 mm, crenate on margin, glabrous.

Flower: January- March.

Fruit: April-August.

Ecology: Common, found in open secondary forest, growing on dry, loose, brown soil, 40% slope; it climbs up *Garcinia andamanica* and associated climber is *Vitis* sp, *Tetracera sermentosa.*

World distribution: India, Sri Lanka, Pakistan and Malaysia.

Andaman Islands: Andaman group of Islands.

Specimen examined: N. Andaman: Nabagram (09.12.2002) *A. Ghosh*.503 (CUH).

4. *Tetrastigma planicaule* (Hooker) Gagnepain, Notul. Syst. (Paris) 1: 319. 1910. *Vitis planicaulis* Hooker, Curtis Bot. Mag. 94: t. 5685. 1868.

Liana; stem flat. Branchlets terete or slightly flat with longitudinal ridges, glabrous; tendrils unbranched. Leaves palmately quinquefoliolate; leaflets elliptic-lanceolate, lanceolate, or ovate-lanceolate, 9-16 x 6-7 cm, glabrous, lateral veins 5 or 6 pairs, veinlets raised, base cuneate, margin 5-9-toothed on each side, teeth inconspicuous or fine, rarely large, apex acuminate or acute; petiole 3-11 cm, glabrous, petiolules 0.5-3 cm, central petiolule 2-4 as long as lateral petiolules, glabrous. Inflorescence umbelliform, axillary, 15-17 cm, with nodes and brown bracts, rarely inflorescence leaf-opposed and without nodes and bracts; peduncle 3-4 cm, glabrous. Pedicel 3-10 mm, glabrous or sparsely pilose. Buds oval, 2.5-3 mm, apex obtuse. Calyx shallow and saucer-shaped, papillose, teeth inconspicuous. Petals ovate-triangular, 2-2.5 mm, apex galeate, sparsely papillose. Filaments filiform; anthers yellow, oval, short and abortive in female flowers. Disc well-developed, 4-lobed, or inconspicuous and annular in female flowers. Ovary broadly coniform, base papillose; style inconspicuous; stigma 4-lobed. Berry, globose, 2-3 cm in diam., 1- or 2(or 3)-seeded. Seeds 1-3, oblong, base sharp, apex rounded, ventral holes furrowed from base to tip.

Flower: April-June.

Fruit: August-December.

Ecology: Not Frequent, found in roadside, secondary forest, growing on rocky substratum, black soil, altitude 100-500 m, 70% slope; it climbs up and forming canopy over *Lagerstromia* sp. and associated climber are *Raphidophora* sp. and *Illegera appendiculata.*

World distribution: India, Laos, Sri Lanka and Vietnam.

Andaman Islands: North Andaman Islands.

Specimen examined: N. Andaman: Krishorinagar (16.11.2002) *A. Ghosh*.633 (CUH).

5. *Tetrastigma serrulatum* (Roxb.) Planch. in DC., Monog. Phan 5C. 432. 1887; Momiyame in EFPN 2: 95. 1979. *Cissus serrulata* Roxb. , Fl. Ind. 1: 432. 1820. *Vitis capriolata* (D.Don) Royle, Ill. Bot. Him.

149. t. 26, f. 2. 1939; Lawson in FBI 1: 659. 1875. *Tetrastigma offine* (Osmaston) Raizada & Sexena in 1F 92: 325. 1966.

Tendril climber, branch ribbed, slender, wiry, quite glabrous. Leaves alternate, compound, 5 foliolate, 8-15 cm; leaflets ovate-subovate, 3.5-8 x 2-4 cm, apex abruptly acute, base shortly acuminate, margin distinctly serrulate, 9-10 secondary nerves, craspedodromous, coriaceous, glabrous; petiole 6-7.5 cm, glabrous; petiolule 1-1.5 cm; tendril leaf opposed, slender, simple, coiled. Inflorescences axillary, umbellately cymes, panicled, 2.5 cm; peduncle 2 cm; bracteolate, many, ovate, conspicuous, 2.5 mm; pedicel 0.5-1 cm. Flowers many, small, unisexual, actinomorphic, 4-merous; 4 mm across. Calyx tube 4-lobed, 1 mm. Corolla 4, greenish, ovate, 1.5 mm. Stamens 4, disc thick. Ovary 2-celled; 2 ovules in each cell, 1 mm, style very short, stigma large flat. Berry, globose, 2 x 1.5 cm, black. Seeds 2-4, obovoid, 0.8 x 0.5 cm, thick.

Flower: March-June.

Fruit: July-October.

Ecology: Not frequent, growing along roadsides in loose soil, also found in edges of secondary forests, it climbs up bamboo fencing and associated climber is *Dioscorea sp*.

World distribution: India and Bangladesh.

Andaman Islands: Andaman group of Islands and North and South Nicobar.

Specimen examined: N. Andaman: Ganeshnagar (27.12.2001) *A. Ghosh*.72 (CUH).

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