

## A BOTANICAL ACCOUNT OF VĀLMIKĪ'S PAÑCAVAṬĪ

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Ancient Sanskrit texts contain enough botanical informations and bring out appreciable wealth of reliable details on plants of our ancient wisdom. It also aids in clarifying their botanical identity when the etymology of their names is judiciously explored. Vālmikī's *Rāmāyaṇa* is particularly useful here. It lists plants extensively, often specifies their geographical location and offers diverse and sometimes new informations. The flora of a reliably identifiable area of his Pañcavaṭī is examined here accordingly and almost in his own words in translation. The full flora is brought out, compared to Cooke's flora of the region and the importance of such studies is highlighted.

**Key Words:** Cooke's flora, Pañcavaṭī's geography.

Vālmikī's Pañcavaṭī (a place of five Banyans) is identified with the northern part of Nāsika *ṣeṭra*, the southern being Nāsik, the two separated by Godāvari – all, in modern Maharashtra. It is a specific spot in *Rāmāyaṇa* recognisable even now. It was a small locality of a larger Dandakāranya so named after one Danda, a son of Rāma's ancestor Ikṣvāku, who was banished there. The forest here was thus known earlier to Rāma's times. Its limits were Vindhya in the north, Krishna river in the south and the mouth of Godavari in the east; (fig.1). Ecologically this forms a *sal* forest region. It was from Citrakūṭa that Rāma came here via three specified halts i.e. at *āśramas* of Sutīkṣṇa, of Agastya's brother and of sage Agastya. On request, Agastya tells Rāma to develop his own fresh *āśramapada* in Pañcavaṭī, two *yojanas* down south near Godāvarī which was famous by that name even earlier<sup>1</sup>.

The story covered is from Sutīkṣṇa's directing (VR. 3.11.38) till Rama's appeal to the trees to tell him the whereabouts of Sītā (3.6.22) i.e. what happened around Pañcavaṭī. Botanical aspects studied are the data of Vālmikī concerning forests and plants in general and individual plants by name. The latter as a means of correct botanical identification is of greater interest. But the former aids us in learning the overview, of Vālmikī's forest description, and his many technical terms eg. *vanoddeśa* a specific spot in the forest, *sthālīprāva*, a raised and cleared table-land (for raising pepper groves in forests), *dāma* (a rope literally, but used here for forests of lianas), *āśramapada* (like jana pada) a specific *āśrama* settlement etc. Two reputed editions

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of *Rāmāyaṇa* are studied viz. Gorakhpur<sup>3</sup> and Sātvalekar<sup>4</sup>. Both are similar in the portions referred; but the citation numerals have been taken from the former.

#### METHODOLOGY

Faithful data in translation on plants from Vālmikī are depicted in a definitive format first and then studied rigorously with etymological considerations of name terms (mainly aided with Monier-Williams<sup>7</sup> (MW) and Krishnamurthy<sup>5</sup> (K) as the key. In most lexicons where these names abound, a single plant (pl.) usually has a string of names and the same name often occurs in many. A way to bring order in this confused state is to start classifying all the names into basonyms and synonyms. Basonyms are mostly unique to the plant concerned and are unlikely to be applied to other plants as well. Their etymology is either unknown or not clear (eg. *ankoṭa*). A plant usually has one basonym (as for rice, *Oryza sativa* L.) or two (as *vaṭa* and *nyāgrodha* for banyan, *Ficus bengalensis* L) but never many. However synonyms are many and are often likely to be applied to more than one plant. They reflect various features such as morphology, fragrance, procurement details etc. and can thus be further grouped and studied. Criteria for fixing the basonyms and the advantages in studying the meanings of the names have already been highlighted<sup>6</sup>. Vālmikī is studied in this perspective here.

The data for individual plants is given in a definitive format. This has four sections with entries as follows:

A. The preliminaries: a. Serial numbering of the plants studied. b. Its name as Vālmikī gives, and alternatives if any, that he himself gives (shown in brackets). c. Classification of this name as a basonym or a synonym; if latter, specifying as to which basonym is this a synonym.

B. Etymological considerations: Notes from Monier-Williams, Krishnamurthy and Cooke's flora a. Vālmikī's own data (VR) in translation on the plant in the *Rāmāyaṇa* specifying the verses. This information is given in two manners: (i) unbracketed, where this is directly available in VR and hence just translated and (ii) bracketed, where this is inferred from the context and other sources. b. Wherever enough detail is available in VR, a full botanical profile of the plant is also given within brackets.

C. Botanical identification: a. The Latin name of the plant if the identity is accepted. b. The Latin names of the several claimants if the identity is not established. c. Suggestions for further study.

D. Corroborative notes from Cooke's Flora (Cooke)-given in a separate paragraph: a. These include easily recognisable features of the plant such as gross morphology,

flowering seasons and those that could have been recognised and named by Sanskrit-authors. b. Regional language names specially if they happen to be cognate with a Sanskrit term.

Asteriks (\*) indicate the author's new remarks. Insistence on etymology has been done judiciously. For, none exists in some cases (e.g. *padma*, *panasa*, *tāla*) while more than one (e.g. *arjuna*, see below) interpretations are possible in many. It is also advisable to give due value to the consensus of the experts, if available. With such cautions, etymology can be productive. For, in many cases nothing but the name exists; every name has a definitive information which is to be put to the best use.

Examining Vālmīkī's references in his entire text is useful to assess his other informations on the plant in question. If he gives any 'new' *identificatory* information anywhere else and ascertains if he contradicts the present day synonymy anywhere. The last aspect is important. For example sometimes he has included what is now regarded as two or more synonyms for the same plant in the same list. We are to conclude therefore that these two refers to two *different* plants and not to the same one, when, he contra-indicates the presumed synonymy of the later authors. Othwise this is a case of Law of contra-indication (specified as CIL below) whose value becomes greater if some other author contra-indicates similarly.

Studying literary texts like *Rāmāyaṇa* to aid botanical identification has its merits. They mostly give only basonyms i.e they tend to call a plant by its most distinctive name-term. They often give stray identificatory informations (e.g. on habitat of the plants *giri sānu pradeśa* i.e. hill-slope region; habit, with most branches growing downwards-*nitāna* etc.). They are the best and often the only source of phenological data *viz.*, time and seasons of the opening of flowers or fruiting etc.; and, the colour or the smells of the flowers. Poets like Kālidāsa often corroborate this data.

*Flora of Pañcavaṭī*: Descriptive specifications for plants here are mostly in Vālmīkī's words and given below in sections I, II & III,

#### I. PLANTS FROM SUTĪKṢṂA'S ĀŚRAMA TO PAÑCAVAṬĪ:

SutīkṣṂa tells Rāma, "Travel four *yojanas* from here southwards to reach the *āśrama* of Agastya's brother. This is situated on a specific forest-spot (*vanoddeśa*), rather raised and table - land like and specially cleared for the purpose and adorned with groves of *pippalī* (cultivated there). This is also charming with many (other) kinds of flowers and fruits. Many kinds of lotuses and also many graceful water reservoirs are found there. After a night's rest, travel next morning taking the

southern direction and by the side of a *vanakhanḍa* – a discrete segment of forest, go to Agastya's after an interval of just one *yojana*." Rāma travelled accordingly, seeing picturesque forests, mountains that were so high as if they were touching the clouds and lakes and rivulets as well, in plenty. He first reached the *āśrama* of Agastya's brother, recognising it by the thousands of trees – bent down by the weight of their fruits and flowers. Characteristically, there were the groves of *pippalī* readily recognisable as their ripened fruits wafted a pungent smell even from a distance and far across the woods. After a night's halt, he resumed journey to Agastya seeing many trees again on the way (3.11.37-42, 71-78). It is therefore inferred from this and the account below that VR gives clear geographical details, knew the forest and its components well and the account is *not* just fancy.

LISTING OF THE PLANTS SERIALLY: (as per the format above)

1. *Padma (Padmīnī)*: MW. Ety. o; a lotus (flower of *Nelumbium speciosum* that closes at evening, often confused with *Nymphaea alba*). VR uses this name here (3.11.40) as a general term for lotus though he himself recognises many kinds of them later (see below).
2. *Pippalī (Pippalikā)*: a basonym. MW. Ety. o, long pepper; To Krishnamurthy the name means "like *pippala*, the fruit of *pippala* or *Ficus religiosa* but diminutive". VR cultivated as a grove on specific table-lands cleared within forests (3.11.29); accosts the travellers even from a distance with a pungent fragrance of its ripe fruits (3.11.50). *Piper longa* Linn.

Cooke mentions it as a native of hotter parts of India, only occasionally cultivated in Bombay presidency.

3. *Darbhā*: a basonym. MW. Ety. from *ḍrbh*, a tuft of grass (specially of *Kuśa* used for sacrificial purposes though MW himself notes later that this is different from *kuśa* and *kāśa*); K. Ety. refers to the bunch like habit of the plant or its usual use in ceremonies as neatly cut and tied bunches\* VR cut bunches spread out as seat with their pointed ends eastwards for sacred purposes (1.3.2) but towards the right in *śrāddha* performance (2.104.8); of the lustre of sapphire (when fresh, cf. *Nīla dūrvā*, chopped and kept stored (3.11.50); leaf, rather elongatedly pointed since Rāma uses a shred from its seat as a missile (5.38.29). (Vālmikī considers *darbha* and *kuśa* as synonymous, for, when *darbha* (6.21.1) is referred again a little later (6.21.10) he used the term *kuśa*). (*Darbha* is a grass used in sacred rituals in neatly cut bunches; soft, since it commonly forms a seat-spread or *barhi*; leaf is elongatedly pointed and of sapphire like lustre when fresh). Claimants are: *Desmostachys bipinnata* Stapf. (*Kuśa*) and *Imperata cylindrica* Beauv. (*darbhā*). Though this equation is generally accepted, the entire question of equating many well referred

grasses together on a more intensive work remains. These are *darbhā*, *dūrvā*, *nīla dūrvā*, *kuśa*, *kāśa* (detailedly referred by Kālidāsa in his *Ṛtu saṃhāra*) and *śara*.

4. *Nīvāra*: a basonym. MW., Ety. o; equates to wild rice (also referred so in *VS.*, *S. Br.*, *M. bh* etc.); K. considers this from the root *niv-* to become fat i.e. fattening, nourishing?\* – usually considered as a variety of *śālī* or rice. Vālmikī. however means it here (3.11.74) to be a *tree* of the interior forests (it was in flowers and also decorated with creepers around) heading a whole list of them. Can this be *Barringtonia racemosa* Roxb. (based on its Kannada name *nīvāra* as KMN and SJN state; KMN further notes it to be having its habitat as sea coast, Konkan); needs a re-study\*. Quite likely, the name *nīvara* was given to both the plants *Barringtonia* as a tree and wild rice, as a millet.

Cooke: A glabrous tree, often reaching 50 ft. high; bark grey, Fruits ovoid, smooth, crowned with persistent sepals; Flower in April-May. Distribution: along rivers and *nālās*. RLN *Nīlvar* (cognate with *ni-va-ra*), *samudraphal*.

5. *Panasa*: a basonym; probably a native Sanskrit name MW. Ety. root is *pan* (meaning?). VR: a well praised fruit tree of Bhāradwāja's hospitality garden (2.91.30); Citrakūta forest (2.94.8); interior forest on way (3.73.3) and at (3.60.21) Pancavati; deep forest on way to Pampā (3.73.3) and Rāma's palace garden (7.42.3) Fruit is huge and looks picturesquely helpless when cut open and kept lying. VR aptly compares to this, the great massive *vānara* hero, incidentally also called *Panasa*, as he lies helpless and just breathing when wounded in war (6.31.29). *Artocarpus heterophyllus* L.

Cooke: The well known Jack-fruit tree, widely cultivated; Opined by Beddome and Gamble to be indigenous in forests of the western Ghats. RLN. *phanas*.

6. *Sāla*: a basonym. MW. Ety. means wall, fence, house; K. holds that these were grown as a fence, a barricade, a boundary and also used as timber in house construction.\* VR refers it extensively as found in most parts of India and even Lanka The modern ecologists consider the whole region discussed here as a *sāla* forest. They formed a great girdle all around Ayodhyā (1.15.12); were so tall as to be a watch tower (2.96.11, 2.98.16), mighty and majestic (2.20.32, 3.60.21) leaves were large, huge (like *aśvakarṇa* and *tāla*), hence used to thatch Rāma's *parnasālā* (2.19.19); formed a whole forest at the outskirts of Kaliṅganagara bordering Ayodhyā (2.17.10.); an interior forest tree (3.11.74); important huge trees forming the dense foliage canopy of the mountain forests (3.15.13-18); extensive in the *āśrama* regions of coastal southern India along with other tall trees of *tāla* and *tamāla* and were well in flowers (3.35.13); with numerous good looking leaves and fine flowers (4..5.18); seven *sāla* trees had grown in a line, had an extensive foliage and a

support of many branches (which were all felled at one stroke by Rāma 4.11.67, 4.16.23-24), uprooted and used as a mighty weapon in war (also many other references 5.44.12-13 etc. occur). *Shorea robusta* Gaertn.

7. *Vanjula*: MW. Ety. o; but mentions that lexicons equate this to many plants *Dalbergia ougeinensis*. (contradicted by VR here, for this is acceptedly *tiniśa* which is just next in the same line 3.11.74); *Jonesia asoka* (Unlikely, because Valmikī writes about *aśoka* extensively and by that name itself; moreover as MW. himself points out *aśoka* is called *vanjula druma* (and probably not as *Vanjula* alone, if at all), *Calamus rotang* (also called *vanjula priya*) and *Hibiscus mutabilis* (these last two are also unlikely to be the *vanjula* of Vālmikī here (3.11.74) because Vālmikī clearly mentions the latter to be a tree, while both of these are weak stemmed, the former, a cane and the latter a shrub at most and not a tree).\* As such VR's *vanjula* remains to be identified; one clue is that it is likely to be having highly flexible branches which is what *vanjula* seems to mean. Vālmikī mentions it only twice, both the times as a forest tree (3.11.74; 4.50.25). The problem remains and needs a re-study. Can this be *Salix tetrasperma* Roxb called *nīr* (water) of *vanji* in Tamil "Common by water course but lofty trees on hills?"; its Kannada name is also *nīravanji*, supporting this conclusion?\*

Cooke: *Salix tetrasperma*, a much branched tree, 20-40 ft. high; bark rough with deep vertical furrows; young shoots silky, becoming glabrous. Flowering in October Dist. Deccan, Poona, Mahabaleshwar, and other moist places. RLN. *Wālunj* (cognate to *vanjula*?)

8. *Tiniśa*: a basonym. MW. Ety. o, but mentions a variant as *timiśa* occurring in *Rāmāyaṇa* itself (2.94.8) and equates to *Dalbergia ougeinensis*. Bh.p. points out that some regard this to be a synonym of *syandana* (contradicted\* by Caraka. ci. 3.257.) and stresses the need to consider *siddha* (*Lagerstroemia parviflora* Roxb.), *siddhaka* (Suśruta Ka. 3.9) which may be the *syandana* of Vālmikī and Kālidāsa.

Can this be *Lagerstroemia lanceolata* Wall. (another species of the genus different from *L. parviflora* Roxb. identified as *siddha* above and *L. flosreginae* often called *arjuna* itself).? Interestingly this is common in the western Ghats. (KMN)

Vālmikī does not mention *siddha*, *siddhaka*: his *tiniśa* is a charming tree of Citrakūṭa forest (2.94.8); an interior forest tree (3.11.74); a large tree of Pañcavaṇī forest (3.15.16); around Pampā lake (this *śloka* contradicts its synonymy with *syandana* as the latter occurs at the end of the same line.) (4.1.82); an attractive tree of the shores (4.27.18); a forest tree impeding the monkey army (6.2.72); many *tiniśa* trees with flowers at spring (6.4.81); big and sturdy to be used for bridge construction (6.22.56). A re-study is needed to consider *Lagerstroemia lanceolaria*

Wall, as being more suitable.

Cooke: *L. lanceolaria*, a large tree, 30-50 ft. high; bark ash coloured and peels off in large strips; Flowers in March-April, Dist. from Bombay southwards. RLN. *Nāna*.

9. *Cirabilva*: a basonym MW. Ety. *cira* long lasting *bilva*-*Aegle marmelos*; equates to *Pongamia glabra* (which however is more commonly called *Karanja*). VR. A tree of forest interior (3.11.74); flowers around Pampā Lake (4.1.78) (many *cira bilva* trees, all in flowers at spring, occurs along with many other trees (6.4.79). *Holoptelia integrifolia*. Planch. (called *Cill bil* (BS) in Hindi- a densely foliaceous tree; girth 2.34 m; flowers in February-March.

Cooke: *H. integrifolia* is a large spreading glabrous deciduous tree, 50-60 ft. high, bark grey. Dist. throughout the presidency in deciduous forests. Flowers in February-March/RLN *Valli*.

10. *Madhūka*: a basonym\* VR: a charming tree of Citrakūṭa forest (2.94.9); of Pañcavati: (3.11.74); occurring as a great forest by itself i.e. where this was the dominant species (3.15.21); sides of Mārīca deer having the colour of *Madhūka* flowers (3.42.17); growing around Pampā lake and in (attractive) flowers (4.1.78); blooming at spring (6.4.79); a tree of Rāma's palace garden (7.42.3). *Madhuca indica* J.F. Gmel.

Cooke: *Basia latifolia* (now *Madhuca indica*) a deciduous tree, 40-50 ft. high; bark thick, dark coloured; branches numerous, spreading, forming a thick shady head, Flowers in January-April; Distributed throughout Konkan, plentiful in Gujarat. RLN. *Moha*, *Mhoya* (related to *Madhuka* of Sanskrit)

11. *Bilva*: a basonym. Pāṇini: Ety. *Belati*-splits, in reference to the leaf shape which appears as if split, probably an original Sanskrit name. VR. six poles of this tree erected as *yūpas* in *yagña* (1.4.22); a tree of thick forests' (1.24.15); fruit: edible; a tree in flower and fruit at Citrakūṭa forest (2.56.71, 2.94.8); an interior forest tree (3.11.74); there was probably a dwarfer life form or a variant viz. *bilvaka*. cut down in many numbers alongwith other trees for use in bridge construction (6.22.57) *Aegle maronelos* Corr.

Cooke: a small tree, armed with strong, straight, sharp spines; Leaves 3 rarely 5 foliate. Flowers in April-May. Dist. cultivated in many places and found occassionally in the Deccan. RLN. *Bel* (evidently related to *Bilva*)

12. *Tinduka*: MW. Ety. o. To Krishnamurthy the name sounds non-sanskrit and has

compared with *tendu* of Hindi a probable cognate. In VR a tree of a wild and terrible forest (1.24.15); of *Citrakūṭa* forest (2.94.8); of the forest interior (3.11.74); a forest tree (like its precedents *jambu*, *priyāla*, *panasa*, all eminently edible). Two species of *Diospyros* seem to be relevant here; *D. embryopteris* Pers. (Indian persimon of wild mangosteen), *D. tomentosa* Roxb. the former, more suitable because of its edible fruit.

Plants from 4-12 are forest trees in attractive flowers borne at the ends of branches and adorned with creepers climbing around. Rāma saw hundreds of them in the interior forest on his way to Agastya (3.11.77). Then he notices Agastya's *āśrama* itself characterised by trees that bore viscid glaucous leaves (*snigdha patra*) and were shady, shining as if oily-so rich was the verdure-bestowing tranquility (3.11.78). Rāma requested Agastya then for a place endowed with water and many forests (3.13.11). Agastya replied "Two *yojana*'s from here is a region of many (edible) tubers, roots, fruits and much water. It is also auspicious, has many animals and is well known as Pañcavaṭī. Sītā will deeply enjoy there, near Godāvāri, as the spot (*vanoddeśa*) is sheltered, holy and charming. See this great forest of *madhūka* (3.13.21, see 10), go on its north side; cross beyond the *nyāgrodhā* tree there (see 13), and on a raised ground there not far from the mountain, you will get at the area called Pañcavaṭī – a forest always in flowers (3.13.21-22)". On his way then Rāma saw Pañcavaṭī forest endowed with various beasts and other animals (3.15.1). This was a whole region of forest in flowers (3.15.2). He then directed Lakṣmaṇa to survey all over and select a spot charming in the splendour of forest as well as of water and where sacrificial fuel (*samidhā*) and *kuśa* were also available nearby (3.15.5). As requested Lakṣmaṇa does so. This had a level ground and was surrounded by trees in flowers (3.15.10). It was quite near Godāvāri which was also bordered with trees in flowers. The individual plants recognized here are as below.

## II. PLANTS AT PAÑCAVAṬĪ

13. *Nyāgrodhā*: a basonym. MW. Ety. root is *nyag* coming down, *rodhā* growing, in reference to aerial downward roots that grow up after reaching the ground. VR. its latex, used to braid an ascetic's hair (2.52.68); reference here is to an individual *nyāgrodhā* tree given a proper name "*Shyāmā Vaṭa*" (a dark shady banyan) at Prayāga.

This was stupendously large, great with shining foliage and surrounded by many (subsidiary) trees all around (2.55.23) It is interesting to note that this particular tree was referred to as *akṣaya vaṭa* deathless banyan as living still, till about 100 years back, and is extensively referred to by Cunningham; its shade was particularly dark and cool, covered as it was by a dense canopy of the greenish yellow foliage (2.55.23); a tree of Pañcavaṭī (3.13.21); refers to another individual



tree called *Subhadrā* (very firmy rooted), also lofty, extensive and having a canopy of foliage like that of the clouds (so high and thick) and spreading 100 *yojanas* (3.35.27.36); a model of majesty to which Rāma himself was compared by Sītā (3.47.34); a forest tree (3.73.3), so common as to impede the marching monkey army and getting broken (6.4.73); refers to one more individual Banyan tree in the *Nikumbhila* forest of Laṅkā, a formidable looking tree which had its foliage canopy held high up so that it resembled a heap of dark blue (rain bearing) clouds.

*Vaṭa*, another basonym for the banyan. MW. perhaps from the *Prākṛt* for *vaṭa*. "surrounded, covered". VR refers (only once probably) as growing around Pampā lake (3.75.24). *Ficus bengalensis* Linn.

Cooke: gives two more celebrated individual banyan trees: *kaḃīr Bās*, in an island of Narmadā river opposite the village of *Sukiltirat* (obviously *śukla tīrtha*) about 12 miles from Brooch, and a very large tree near Jaoli, a village in Satara Collectorate.

14. *Kuśa* (also *Kutha?*): MW. Ety. o; a grass called *darbhā* by Brāhmins; the sacred grass of religious ceremonies, *Poa cynosuroides* a grass with long pointed stalks; a rope made up of *kuśa* grass, was used to join the yoke of a plough with the pole; associated words: *kuśa cira*, garment of *kuśa* grass; *Kuśa kāsa maya Bh. P. 3.22* (syn. between *kuśa* and *kasa* contraindicated\*), *Kuśa dūrvā maya* (Harsha Carita) (syn. between *kuśa* and *dūrvā* contraindicated,...).

VR: a requisite for rituals (3.15.5); a grass used for thatching the *Parnaśālā* at Pañcavaṭī (along with *kāsa* and *śara* (3.15.22), see *darbhā* above.

Cooke: *Ergrostics cynosuroides* Beav (a synonym of *Poa cynosuroides*) considered as *darbha* or *kuśa*. A perennial tall grass, branched from the base; stolons very stout, covered with shining sheaths. Leaves sometimes 20 inches long, rigid, acuminate, with filiform tips and hispid margins; Dist. Deccan, Nasik, throughout India in hot places.

15. *Padma* (see 1): VR. sometimes waters of Ganga get crowded with forests of *padma* flowers (2.50.20); means a specific lotus here (3.15.1) whose flowers are (glorious) like sun (i.e. large and open the whole day), charmingly fragrant and adorning a whole lotus lake (so profuse). Pampā lake brimming with many *Padma* flowers that seemed to be pressing down its waters (3.75.20, 21; this is an important passage as it gives a whole list of different lotuses occurring together showing thereby that their name are not synonyms. They are: (i) *padma saugandhikā* (a very fragrant *padma*-probably the same as in 3.15.11 which is described *surabhi gandhi*, these are copper coloured (*tāmra*). (ii) *kumuda maṅḃala* these were white, forming

a white zone itself. (iii) *kuvalaya*, blue and forming a showy clump (*udghaṭa*) of their own (iv) There were also *aravinda* and *utpala*. All were so plentiful, forming separate zones, so that the whole lake was as if painted (*kuthamiva*) with many colours; Pampā lake with *padma* and *utpala* (4.1.3 contradicting their synonyms); Pampā lake covered over with *nalina*, another lotus (4.1.7); wind bearing the fragrance of *padma saugandhika* (4.1.104); water reservoirs charming with fully blown *padma saugandhika*, *kumuda*, *utpala*; horses of Rama's chariot (in his battle) were of steady (i.e unshaking) heart like the stalks of *padma* flowers (which do not shake even if the flower are wind-struck) (6.107.16) .

*Bisa* is the edible tuber and *mṛṇāla* mostly the edible leaf stalks. *Rājīva* is a lotus whose petals have streaks (*rājī*). A general equation: *utpala* is *Nymphaea nouchali* Burn; *Kamala* and *Padma* are synonyms-*Nelumbo nucifera* Gaertn. Flower colour varies in *Nymphaea* while *Nelumbium* has only white (*kumuda*) or red flowers.

Cooke: *Nymphaea lotus*, *kamal*; red, *rubia* Roxb; *N. stellata* willd var. *pubescens* Book Fruit (root and seeds *padmākṣa*, eaten), petals streaked with purple lines (*rājīva*): *Nelumbium* rosy white or yellow. *N. speciosum* willd (tender roots and rhizomes edible). *N. stellata* willd flowers blue, white, rose, purple, *N. pubescens* willd, white or red, *nelumbium speciosum* willd. rose, white or yellow.

*Bisa* refers to rhizome of either of these two genera *Nymphaea* and *Nelumbium*; *mṛṇāla* to their leaf stalks. Genus *Nymphaea* shows greater variation in flowers colours-blue (*indīvara*), an interesting feature is it opens by night (*kumuda*) or day exclusively. *Nelumbium* was equated by the early europeans to the *nīlambū* (blue flowers in Tamil. See also Bailey, *Manual of Cultivated Plants* for this ety.) but does not show this blue colour.

A more collative work is needed, for instance in the light of the details given by Kālidāsa in his *Rtusamhāra* and *Meghadūta*.

16. *Sāla*: (3.15.16) See 6

17. *Tāla*: a basonym. MW. Ety. o; probably a native sanskrit name; its current RLNs are cognate\* to this as *tāḍ*, *tāle* (Kannada) etc., though in Tamil it is *panai* (*maram*). VR. : a tall tree but dwarfed in Bhāradvāja's *āśrama* (2.91.50); leaves large, used for thatching Rāma's cottage in Pañcavaṭī (23.35.13); a charming tree of Pañcavaṭī forest (others: *sāla*, *tamāla*, 3.15.16); a decorative tall forest tree (3.44.16); a measure of height (since the trees when well grown are of rather uniform height) (3.44.16); fruits looking only (*snigdha*) (5.18.11); leaf, big and used as fan (5.56.36); many *tāla* trees surround a lofty mountain (6.22.56); used as

rafters in bridge construction (6.39.3); abundant in Laṅkā's Suvēla mountain (6.67.159); used as a long and hefty weapon in war (6.77.61); its ripe fruits likely to be felled down by strong winds (4.40.53); its figure used as an insignia (on flag; this was so in *Mahābhārata* also) (4.40.53). *Borassus flabellifer* L.

Cooke: Palmyra tree, a native of tropical Africa, cultivated or self-sown. Trunk attains 110 ft. high and 2ft. in diameter near the ground. dist. cultivated throughout India. RLN. *Tādi*, *Tār*.

18. *Tamāla*: a basonym. MW. Ety. o; dark barked (but white blossomed *Xanthochymus pictoriosis*; VR (as *tāmālaka*) a tall tree, dwarfed in Bhāradvāja's *āśrama* (2.91.50); a charming tree of Pāñcavaṭī forest (3.15.16); flowers in abundance (3.35.23); decorative trees of Prasravaṇa mountain (4.27.17); its pure forests forming particularly dark groves in the west coast of India (4.42.11); forming a forest cover by itself (i.e. where mostly *tamāla* trees alone grow) for Lanka's Suvēla mountain (6.39.3) (These are tall picturesque trees, give dense shade and often occur in great abundance as forests by themselves). *Cinnamomum tamala*.

Cooke: does not include this species of *Cinnamomum*.

19. *Kharjūra*: a basonym. MW. Ety. o; *Phoenix sylvestris*; referred in TS; another name is *kharjūri*, wild date tree; an associated word is interesting: *Kharjūrapura* (a city has been derived abounding in *kharjūra*) which is the modern Khajuraho of Bundelkhand; To the author its Ety. has been derived from (*kharju*) itching, scratching, in reference to its abundant spiny leaves and persistent leaf stumps all over the trunk.\* VR a decorative tree of Pāñcavaṭī (3.15.16); well in flowers in Laṅkā at Trikūṭa mountain slope (4.2.9). Claimants: *Phoenix sylvestris* Roxb., *P. dactylifer* L. *P. humilis* Royle, *P. acaulis* Buch. Han.

Cooke: none of *Phoenix* species included have any RLN cognate to *Kharjūra*.

20. *Panasa*: (3.15.15) see 5.

21. *Nivara*: (3.15.16) see 4. VR here definitely means this to be a tree (and not wild rice)

22. *Tiniśa*: (3.15.16) see 8. This is not *syandana* (as the latter appears in the same list at 3.15.18).

23. *Pumnāga*: a basonym. MW. Ety. an elephant among men i.e. much distinguished. K. Is this name in reference to its very resplendent white flowers\*? VR a plant of Citrakūṭa forest shedding abundant flowers on the grass land below (2.9.24);

a big decorative tree of Pañcavaṭī forest (3.15.16); in abundant flowers around Pampā lake (3.75.23); the belly (*kukṣi*) of western region of India has dense (forests of) *pumnāga* trees; a valuable garden tree (4.50.25); its flowers yield scenting material for delicious eatables (5.10.23); many in number, beautiful with abundant flowers and with fully developed roots i.e. they are age old trees of the garden (5.14.9-10). *Calophyllum inophyllum*. L.

Cooke: A very handsome, small or middle sized glabrous tree with a crooked trunk. Flowering in December-January cultivated throughout India, indigenous in the coastal districts of the Presidency. (see VR above).

24. *Cūta*: a basonym, K: probably an original Sanskrit name VR a forest tree (3.73.3); in attractive flowers at spring and growing around Pampā lake (4.1.80); its fragrant flowers added to food delicacies (5.10.25); the tree is in flower at the commencement of spring (5.14.3); a forest tree so frequent as to be broken by the advancing monkey army (6.4.72); well in flowers and used as a ponderous weapon in war (6.59.77); adorns Rāma's palace garden (7.42.2).

(Mango has two basonyms *cūta* and *āmra* like banyan with its *nyagrodha* and *vaṭa* and peepul its *aśvattha* and *bodhi*). VR seems to use *cūta* when flowers are referred and *āmra* when fruits are referred; the two never occur together denying their synonymy; when mango groves are meant he calls them *āmra vaṇa*, interestingly, an *apabhramoha* form and not *āmravana*. *Mangifera indica* L.

Cooke: Cultivated throughout India and in the tropics generally.

25. *Aśoka*: MW. Not causing sorrow; well referred in literature; a *dohada* tree. VR Various, references as, a decorative tree of Kaikeyi's palace (the other is *campaka*); a tree of Pañcavaṭī (3.15.17; 3.42.31); Sitā kept in *aśoka vātikā*, the garden of *aśoka* trees (predominantly) (The term probably meant a private palace garden that would render the visitors get rid of grief by its sheer beauty, there being an *aśoka vanikā* in Rāma's palace also); a remover of grief (3.60.17); very beloved to Sitā, behind its branches she was suspected to be hiding (3.62.3); *agnimukhya aśoka*, that had flame (i.e. scarlet) red flowers (there being a blue of *nilāśoka* mentioned in the previous line and elsewhere also and also a golden flowered i.e. yellow type) (3.73.5); bunches of *aśoka* flowers look like burning coals (4.1.29); flowers at spring (5.14.3); destroy grief and are full of flowers from root onwards, hence removing grief by their very splendour (5.75); in the *aśoka vanikā* (of Rāvaṇa) there were *aśokas* that had flowers (yellow) like golden vessels, others glowing red, still others, of the glow of the blue steady flame of *nilānjana* (or the oil lamp before the gods) and all of these were in thousands (5.15.10, 11); (3 types are clearly mentioned, the scarlet red, the most common, the blue mentioned at a few other

places also and golden yellow mentioned only here); Rāvaṇa looked grand like a mountain beautified with *aśoka* trees in plenty with their red leafy sprouts and scarlet red flowers (5.22); a common forest tree impeding and broken by the monkey army (6.4.72); used for bridge construction (6.22.57); a charming tree of Laṅkā's Suvēla mountain (6.39.3)

Cooke: A tree, 20-30 ft., high; branches, glabrous Flowers fragrant, numerous, in dense axillary corymbs, 3-4 inches across; calyx passing from yellow to orange and finally red; petals: o, stamens much exerted, filiform, anthers purple.

A very handsome tree when in full flowers Dist. common in South Konkan, RLN. *Ashik, Jasvant.*

26. *Tilaka*: a basonym. MW, Ety. a freckle, compared to *tila* – sesame seed, gives two claimants *Chlorodendron phlomides* (unsuitable here\*, as it is not a tree) and *Symplocos racemosa* (also unlikely\* as this is more commonly called *lodhra*). His other meaning i.e. the ornament of anything, is more pertinent here. VR. a big tree dwarfed in Bhāradvāja's *āśrama* (2.91.50); a large tree of Pañcavaṭī (3.15.17); an excellent tree sung to by bees because of its profuse flowers (3.60.16); bears grand bunches of flowers to which bees suddenly rush in (4.1.58); growing around Pampā lake and in flowers (4.1.78); a common forest tree impeding and broken by the monkey army (6.4.72); flowers at spring (6.4.79); trees used for bridge construction (6.22.56); a tree surrounding Suvēla mountain in Lanka (6.39.4).

(This is a grand, tall tree of forests bearing attractive bunches of flowers in profusion at spring. Is the term *tilaka*, which means "the eminent, the ornament or the insignial and the decorative", given to the plant because of its grand flowers\* *Wendlandia exerta* DC.

Cooke: notes (however, that) this as a small deciduous, pubescent, crooked tree; Flowers fragrant, corolla white. Flowering in March-April. Thus this is not such a grand tree as Sanskrit descriptions mean. Needs a re-study.

27. *Ketakī*: a basonym. MW. Ety. o; K. probably a native Sanskrit name; its current name in most regional languages (eg. *kevdā, kedage* etc.,) are cognate to *Ketakī*. VR flowers have an oily yellow hue much like the mineral ores (2.94.6); a flowering tree of Pañcavaṭī (3.15.11); a tree adorning Pampā lake (3.75.24); growing around in Pampā lake and in abundance of flowers (4.1.77); an attractive tree of shores (4.27.10); whole hill becoming fragrant because of its flowers (4.28.9); fragrance, intoxicative (4.28.8); many such belts occur in the sea coast of western India (4.42.11); flowers in abundance around charming table lands of mountains (6.4.77-78). (This is a charming tree of watery borders bearing intoxicatingly fra-

grant yellow flowers in great abundance). *Pandanus tectorius* Soland (one of the famous Indian flowering trees where there has been no botanical dispute in identification).

Cooke: Dist. in sandy places near the sea-coast; at sea coast of Indian peninsula on both sides; often planted. RLN *Keura*.

28. *Campaka*: a basonym. MW. Ety. O; K. an original Sanskrit name (most RLNs are the same) or related to Tamil (*sembagan*), the copper coloured (flowers\*?) VR. an adorning tree of Kaikeyi's palace (2.10.3); a decorative tree of Pañcavaṭī (3.15.17); a tree common and so abundant in Malaya and Sahyādri mountains as to be broken by the advancing monkey army (6.4.72-73); flowers of golden and fair hue (to which Rāma compares Sitā's neck) (3.60.32); a component of gardens and forests in Lañkā's Suvēla mountain (6.39.3) (This is a much praised tree for its oily yellow, fragrant and characteristic flower; It is found growing in forests and is also cultivated in gardens). *Michelia champaka* L (another favourite flowering tree of India like *ketaki* where also there has been no botanical dispute).

Cooke: Dist. not wild in the Bombay Presidency; the tree is commonly planted near the temples; fragrant flowers used in religious ceremonies and by women for their hair. Flowering in April-September.

No. 15-28 are all trees encircling the mountains of Pañcavaṭī region. They render the later itself gentle and inviting. All are in flowers, some golden, others silvery white, yet others coppery red. All are found growing so densely and interlacingly that the whole mountain side looked picturesque, as if (crowded) with specially decorated (huge) elephants (of diverse hues in their respective regalia). They are all grand trees of the forest bearing, golden yellow, white and red flowers. They grow all over the whole ranges of the hills densely and interspersedly making the regions themselves coloured accordingly (3.15.14-15). Along with these there were also other flowering plants, bushes and climbers surrounding their own trees (3.15.17). A few more individual trees mentioned here are follows:

29. *Syandana*: a basonym. BS. suggests that *syandana* may be variously taken as a term applicable to timber trees formerly used for making chariot wheels and axles and/or are characterised by gummy exudation. There is no reason why this should be taken to be a general term like this, for Vālmikī clearly means it to be an individual tree like any others. BS. further considers the following as its synonyms.: *tiniṣa* (contradicted as it appears in VR. in the same list earlier 3.15.15) and *siddhaka*; he also refers *dhava* contradicted as it appear in the very next line. MW. running swifty, a war chariot, *Dalbergia ougeinensis*. VR. a tree of Pañcavaṭī (3.15.18); a tree growing around Pampā lake (4.1.92).

Of the 3 plants mentioned above, only *siddhaka* (conferring power) remains relevant. BS. identifies it as *Lagerstroemia parviflora*, Roxb. its popular name being *siddha* in the forests of Mirjapur. *L. lanceolata* Wall. is an important market timber even now, called *nanadi* in Kannada and *venteak* in Tamil. This may be more relevant here. KMN regards it as common in the western ghats.

30. *Candana*: a basonym. A well known Sanskrit name though etymology is not found. VR reference are very frequent; used as a cosmetic anointment (with *aguru*-a very common associate) (2.15.33); breeze (at Ayodhyā) wafting, clean and intoxicating scent of the fumigation of *candana* and *aguru* (2.71.28); a tree of Pañcavaṭī (3.15.18); a fragrant wood for funeral pyre (list: *candana*, *aguru*, *niryās*, *sarala*, *padmaka*, *devadāru*) (2.76.16); Rāvaṇa saw in the coastal forests of mountains of southern India on his aerial journey the gentle forests of sandal wood trees in thousands; their exudation at the roots was gratifying to the nose (3.35.21); a tree adornig Prasravaṇa peak (4.27.17) *Santalum album*, L.

*Cooke*: Indigenous throughout the dry districts of the Presidency from Nasik southwards; frequently planted in gardens as far north as Gujarat.

31. *Nīpa*: a basonym. MW., (Pāṇīni 4.3.97) situated low, deep; three claimants are suggested: *Nauclea cadamba*; *Ixora bandhuca*; a species of *aśoka*; Krishnamurthy means "at the foot of the hills"; refers to the habitat\*. (BS points out that Kalhaṇa calls this *dhūli kadamba* or *mahā kadamba* and suggests that this may be the *nīpa* variety of *kadamba* or a synonym of *kadamba* plant itself and not only for its fruit). Another *kadamba* is *Mitragyna parviflora* Korth which is hill or *giri kadamba*; yet another is *Adina cordifolia* Benth. Which may be the *nīpa*, while *Anthocephalus cadamba* Miq. is *kadamba* proper)

VR refers it as a charming tree of Citrakūṭa forest (2.94.9); a tree of Pañcavaṭī (3.15.18); its synonym with *kadamba* is contradicted\* as both occur in the same list (viz. 3.60.2 and 3.60.12 respectively); an attractive tree of the river shores (4.27.18); bearing flowers in such abundance as to scent the whole forest interior (4.28.41); in flowers at Trikūṭa mountain in Laṅkā (5.2.10); a forest tree so common as to be broken by the advancing monkey army; (6.4.73) surrounding Laṅkā's Suvēla mountain (6.39.4); a tree of Rāma's palace garden (different from *kadamba* that occurs later in the same list at 7.42.4).\*

Kālidāsa extols much on *kadamba* as a decorative flowers presumably used in singles and not as garlands i.e. he stresses the globose head nature of the inflorescence which is found in *Anthocephalus cadamba* (see below) and *Mitragyna parviflora*. A re-study is needed.

32. *Parnāsa*: MW, Ety. o but equates to *Cedrela toona* or a species of *Basilicum*; According to Krishnamurthy the term is from *parṇa* leaf; can this be taken to mean large feathery leaves or fronds of tree ferns?\* VR refers only once, it as a tree of Pañcavaṭī (its proximates are *nīpa*, *lakuca*). Needs a re-study.

33. *Lakuca*: a basonym; probably an original sanskrit name. In VR. a tree of Pañcavaṭī (no other mention seems to occur in VR). *Artocarpus lakoocha* Roxb.

34. *Dhava*: a basonym. MW; Ety. *dhav*, run, flow; in reference to the oozing exudation of *Anogeissus latifolia*. In VR. a tree of thick and terrible forest (1.24.15,16); a tree of Citrakūṭa (2.94.9) and Pañcavaṭī (3.15.18 and 3.60.21); a tree of Pampā forest (4.1.18). *Anogeissus latifolia* Wall.

35. *Aśvakarṇa*: a basonym. MW., Ety. horse's ear; leaf, of this shape. In VR a tree of thick and terrible forest (1.24.15); large leaves used for thatching Rama's cottage at Citrakūṭa (2.99.15); a large tree of Pañcavaṭī (3.15.18); a big tree used for bridge construction (6.22.56); a huge tree used as a ponderous and mighty weapon in war (mention of such an use is quite frequent 6.43.20, 6.55.77, 6.75.23 etc., but not so much as for *sāla*); a typical, great tree (6.76.66); *Dipterocarpus alatus* Roxb (a wing like projection: leaf, wing like) Since both *ajakarṇa* (sheep's ear) and *aśvakarṇa* equate with *Dipterocarpus* species in all concensus, they should presumably have some resemblances; the differences between them should also lie in the shape of the leaf. Claimants: *D. turbinatus* Gaertn. and *D. alatus* Roxb., both lofty trees of ever green forests; needs a re-study specially to confirm from the leaf-shape. *Shorea robusta* Gaertn. of the same and an equally mighty tree is also sometimes called *aśvakarṇa* though this is more famous as *sāla*.

36. *Khadira*: a basonym MW; Ety, root *khad*, to be steady, firm or solid; to Krishnamurthy this has been mentioned in reference to the very hard wood. In VR its poles erected as *yūpas* in *yagñā* (1.4.2.); a tree of Pañcavaṭī forest (3.15.18). *Acacia catechu* Will.

Cooke; a moderate sized tree, 30-40 ft. high. Dist. the coast of Konkan and north Canara. RLN. *Khair*, *babul*.

37. *Śami*: a basonym MW; from *śam*-pacify; Krishnamurthy holds that probably this is an original sanskrit word (one of the *śānta vṛkṣas*). In VR a large tree of Pañcavaṭī forest (3.15.18); its spreading branches used to roof Rāma's cottage at Pañcavaṭī tying them together firmly (3.15.22). Claimants: *Prosopis spicigera* Linn: (Marathi & Bengali *Sami*; Hindi *cikura*), *Mimosa suma* Roxb. (Marathi-*s'ami*, Oriya-*sumi*, Kannada - *Banni*), *Acacia ferruginea* Dc. Needs a re-study.



Cooke: *Prosopis spicigera* is a tree 30-60 ft. high, root very deep. RLN. *Shemi, Saundad, Sumri, Kandi.*

38. *Kimśuka*: a basonym. MW; *Kim* (what) *śuka* (parrot), "O! is this a parrot" in reference to its beautiful parrot like flowers; *kimśulaka*, a variety of *kimśuka* (Pāṇini 4.3.117). VR refers variously; some are: a mountain tree beautiful with its garlands of flowers blooming at the end of winter (2.63.9); its synonymy with *palāśa* is established in the simile (2.63.8,9) "if some one cuts a mango grove and nurtures *palāśa* grove, looking at its beautiful flowers and greedy therefore that the fruits would also be fine, he would be grieved when the latter yields that fruits of *kimśuka* which are useless;" i.e. the same plant is first called *palāśa* and then *kimśuka*; a charming tree of Pañcavaṭī forest (3.15.18); table lands and mountain backs all around were made beautiful with these trees in flowers at spring around Pampā lake (4.1.82); in such abundance of flowers as to touch the ground with sheer weight (5.15.8); dry and fierce lustre (of the flame) is like a crest of *kimśuka* flowers (5.54.34); resembling each other like the red flowered and large trees (of *kimśuka* and *śālmālī*) (said of Rāma and Rāvaṇa, both severely wounded in battle) (6. 40.14; such comparisons are many). *Butea frondosa* Koen.

Cooke: when in flowers this tree is a conspicuous and handsome object throughout Indian jungles. RLN. *Palās.*

39. *Pātala*: MW., pale red, pink (refers to its colour). In VR a tree of wild and terrible forest (1.24.15); a tree of Pañcavaṭī (3.15.18); an attractive tree in flowers (4.1.80); an attractive flowering tree of the forests; flowers at spring (6.4.80) (interestingly this *śloka* is rather a repetition of 4.1.80 with a slight change; it is *Pāṭalika* here and *pāṭali* at 4.1.80).

Cooke: *Stereospermum suaveolens* a deciduous tree, corolla dull purple. Dist.: Palghat, below Mahabaleswar, dry forests of Dharwar districts. Kanaras, Kali river. RLN. *Pārul. S. cheloniodes*, a large deciduous tree, corolla yellow, veined and tinged with purple. This is found in evergreen and deciduous forests throughout India. RLN. *Padal.*

*Lakṣmaṇa* then constructed a very spacious *parṇaśālā* (leaf house) from the consolidated mud, provided it with good pillars of hollow bamboos (*maskara*, a technical word; *vaṃśa*, see below) and spreading for roof, branches of *śamī*, tying them fast with ropes. This was also well thatched with *kuśa*, *kāsa*, *śara* (the grasses, see above) and leaves (of other plants also) (3.15.21,22).

40. *Vamśa*, a basonym. MW., meaning-family; but Ety, doubtful; to Krishnamurthy is this in reference to the typically clustered habit (i.e. many plants occurring as a

family) ? In VR, these were growing on the banks of Yamuna making a forest by themselves (2.55.8); dried *Vamśa* or bamboos used for making rafts to cross the river (2.55.14); to make pillars (*maskara*) and rafters in cottage construction (3.15.21); has a mountain habitat, surrounding whole hills (5.56.34); a common forest tree (6.12.56) *Bambusa arundinacea* Willd.

Cooke mentions that it is found throughout India except Himālayas. RLN. *Kakak*.

After their sojourn here for some time and when the season of *śarad* ends and *hemanta* begins, Lakṣmaṇa remembers Himālayas probably because of the dense mists of the Pañcavaṭī area and the Nāsik region of the nine peaks where such an overwhelming mist is common even now: "In the icy Himālayan regions, forests are clothed over with mists and when during the day as the sun rises and the mists clear away here and there, there will shine forth the crops of *yava*, *godhūma* and the golden lustrous paddy crops bearing full grains on their tops, the whole clusters looking like inflorescences of *kharjūra* and slightly bent because of the heavy yield that they bear". (3.16.16-17). (Note that all these three are winter crops and the whole description is extremely natural). He also points out that during *hemanta*, the leaves of *kamala* plants would be shattered by age, stamens and thalamus shed down and only the tubular stalks remain; the whole lake would thus not shine as before but would look as stalks remain; the whole lake would thus not shine as before but would look as if laid to waste by *hemanta*; viz this is the behaviour of the *kamala*, a kind of lotus in the season of *hemanta* (3.16.26).

The next, reference to the botanical aspects of Pañcavaṭī is when Rāvaṇa comes to Ramāśrama with Mārīca in his *vimāna*. The first sight that greets him and which he specifically points out to Mārīca is the encircling grove of plantain trees that had been cultivated there by now.

41. *Kadālī*: a basonym. MW., the plantain or the banana; probably an ancient sanskrit name. In VR, references are many; when felled down, the tree looks very pitiable; hence, this is used in a simile to Kauśalyā fallen down (a very frequent simile for frail persons) (2.20.3); the plants gets shaken violently by strong winds; so do the frail persons – another frequent simile, here to Kauśalyā (2.117.80); coastal area of south India adorned with forests of *kadālī* and *Nārikela*, banana and cocount – a familiar picture even now. (In view of such a clear mention of coconut forests in west coast, in other ancient texts as well, can we still hold to the sometimes expressed idea that coconut is exotic to India, its cultivation commencing only with the Portuguese?) (3.36.13); trees grow in such close bushy way as to make it a cover or *guhā* (3.42.22); stem glaucous and smooth; hence compared to the thigh of woman is another frequent simile (3.62.4); grown as border around

settlements and houses (as practiced even now) around *āśramapada* of Rāma (3.42.13) and Agastya (6.123.47). *Musa paradisica* L.

42. *Utpala* MW. Ety. "bursting open"; fully expanded. A lotus VR mentions it as *raktaī padmotpala*, Mārīca deer's mouth was like red *padma* lotus that was bursting open (3.42.16), while the ears were like *indra nilotpala* – the sapphire blue lotus that was also bursting open and the sides were honey coloured like the flowers of *Madhuka* (*Madhūka indica*. Gmel) and also like the thalamus of the lotus (*Kanjakinjalka*). The deer entered into the caves of *kadali* groves and wandered about *karnikāra* trees as well (3.42.17, 23).

43. *Karṇikāra* MW; from *Karṇika*, an auricle, an ear ornament: in reference to its picturesque large flowers. In VR references are extensive;) much loved by Sitā who would often pluck its flowers (3.42.23); typically occurring on hill slopes, flowers-picturusque, exceedingly beautiful and borne aloft on outstretched sticks (*vaṣṭi*) that are leafless (4.1.73); its another habit is to shed down all its glorious flowers together and remain bare for some time after (92.92.23); flowers golden yellow and in picturusque bunches; simultaneously the tree also bears blood red leaf sprouts at the tips of the branches (4.50.26); while on flight Sitā calls forth the *Karṇikāra* trees in flowers at Janasthāna. (the tree is so picturesque, abundant and prominently visible by air) (3.49.30); flowers of the trees so abundant that the whole area looked clothed by pure gold as it were like persons decked in golden yellow brocade (4.1.21) Claimants are: *Ptersopermum acerifilium* willd, *cathatocarpus fistula*. This however needs a re-study with the clue when Sanskrit Texts states: its flowers are non-fragrant and borne on extended stick like branches that have shed down the leaves.

Some more references to the plants of Pañcavaṭī are found when Rāma returns after killing Mārīca; these are:

44. *Kadamba*, a basonym. MW; an assemblage, a collection; Krishnamurthy refers to the head like cluster of flowers, which is its characteristic type of 'inflorescence', identity is undoubted in view of the orange coloured, fragrant attractive flowers of the plant. These are well referred in general literature and are also in use from traditional times onwards. In VR flowers much liked by Sitā (3.50.12); a forest tree in flowers on way to Pampā (3.73.4) and decorating Prasravaṇa mountain (4.27.10); producing flowers in such abundance that they float down (on being shed) the new rain waters of the mountain rivers (variegating the latter with the flowers of *sarja* as well i.e. both are mountain plants growing along water borders): flowers open in the rainy season (4.28.18), bees hanging around their branches give up their intoxication (by the honey of their flowers) in a moment as they are struck by the downpour of the rains (of the rainy season); flowers bloom in rains (4.28.29); their honey is so much and intoxicating as to make the whole area of the forest outskirts

a tavern (other plants in the lists are: (*sarja, arjuna, kandalī*) (4.28.34); flowers have their stamens much extended and they open out afresh at rains; as such, the bees struck by the fresh down pour of rains on the lotuses about which they were hovering so far, come to *Kadamba* instead (which grows amidst other trees and are thus sheltered and not in the open like the lotus – (4.28.42); one of the trees adorning Rāma's palace garden (7.42.5). *Anthocephalus* (which also means head like cluster of flowers, like *kadamba*) *cadamb* Miq.

To Cooke, this plant is of a doubtful native; common near villages throughout Konkan; throughout India, cultivated. RLN. *Nive, Kadam* (cognate respectively to *nīpa* and *kadamba*).

45. *Bilva* (3.60.13). see 11.

46. *Arjuna*, ā basonym. MW; name of the third Pāṇḍava; to Krishnamurthy this Ety. is irrelevant here for this name of the plant is much earlier than Pāṇḍava's period; more correctly, its other, not so commonly known meaning viz white, is relevant here; this is how the term was used by Valmiki himself while referring to Ānjaneya being wrapped in white clothes (*arjuna vastra*) and this is how it was used for a white grass employed during *yagnās* (MW); Compare also the plant's kannada name *bili* (white) *matti* (in reference to the plant's characteristic white surface of the whole huge tree by which it clearly stands out from the other trees of the forest). In VR, a tree loved by Sitā for its flowers (3.60.14); grows on hill slopes (4.1.81) in decorative flowers on Prasaravaṇa mountain (4.27.10); grows in multitudes (along with *kuṭaja*) and as rows with a rich canopy of foliage held high so that these offer a grand sight as the setting sun glows up a whole garland of them (4.28.4); trees in full bloom at the rainy season; they also shed down a downpour of flowers (4.28.9); abounds in the forest outskirts (4.28.41); bears fragrant flowers (4.28.41); rainy winds blow bearing the fragrance of *arjuna* (and *kuṭaja*-a very common associate) (4.30.25); many *arjunatrees* flowering (in spring?) (6.4.80); a big tree used in bridge construction (6.22.56); surrounds Laṅka's Suvēla mountain (6.39.4); a tree adorning Rāma's palace garden (7.42.4) *Terminalia arjuna* W&A

Cooke mentions it as common in jungles south-east of Surat; Belgaum forests. RLN. *Arjun. Arjunasadada, Kahū*. (This is evidently from *Kakubha* below)

47. *Kakubha*, a basonym. MW, means excellent, distinguished; in reference to the lofty stature of the plant; equates to *Terminalia arjuna*; To Krishnamurthy this, however is untenable since Valmikī contradicts it as it is referred to in the line (3.60.15) just next to *arjuna* (3.60.14). In VR it has been described as a tree of wild and terrible forests (1.24.15); a lordly tree with a shining surface of the trunk and teeming with creepers around and also young sprouting leaves and flowers (3.60.15);

the trees grow in charming rows in an even way as if contemplated upon in mind (4.27.24) and then planted. Is this *raktārjuna* – with red bark (KMN) or *T. arjuna* Var *augustifolia* C.G. Clarke?\*

Cooke the Dist. has been mentioned as in the banks of *Kali nadi* and Ghataprabhā.

48. *Tilaka*: (3.60.16) see 26.

49. *Aśoka*: (3.60.17). see 25.

50. *Tāla*: (3.60.18)

51. *Jambū*: MW, Ety. o.; Krishnamurthy mentions it as probably a native sanskrit name; identity undoubted. In VR its branches (and also of rattan canes) were cut down by Lakṣmaṇa to make a comfortable seat in the boat as they crossed the river *Yamunā* i.e. both of these plants grew along the rivers, *jambū* forming the firm stay and the canes, the binding material (2.91.51); a tall tree dwarfed in Bhāradvāja's *āśrama* (2.91.51); a tree of deep forests (3.73.3); its juicy fruits ripen in the forests (3.73.3); its juicy fruits ripen in rainy season (14.28.19); fruits are very juicy and produced in abundance weighing down the branches and looking like burning coals (when cut open) and swarming with insects; ripening in the rainy season. (Note the clarity in description) (4.20.30); a plant of Rāma's palace garden (7.42.5) *Syzygium cumini* L.

Cooke. A large tree. Dist. both wild and cultivated; Konkan, very common in Matheran, Mahabaleswar, commonest on the hill. RLN. *Jambhal*.

52. *Karnikāra*: see 42.

53. *Cūta*: see 24.

54. *Nīpa*: see 31.

55. *Mahāsāla*: the great *Sāla* tree.

56. *Panasa*: see 5.

57. *Dāḍīma*: a basonym. Ety? probably an original sanskrit name identity undoubted In VR, it was appealed to in Pañcavaṭī by Rāma to show him the missing *Sitā* (3.60.21); growing as bushes, gathered from here and there for filling up the bridge (6.22.59); a plant adorning Rāma's palace garden (7.42.5) *Punica granatum* L.

Cooke: A small tree of large shrub, wild in Persia, Kabul, Baluchistan. Largely cultivated.

58. *Bakula*: a basonym. Ety probably an original sanskrit name identity undoubted. In VR a tree appealed to in Pañcavañ by Rāma to show him Sītā (3.60.22); growing near lake (3.75.16); around Pampā lake and in flowers (4.1.78); an attractive trees of the shores (4.27.18) (western India full of *bakula* and also *uddālaka*, another tree?) (4.42.7); an excellent plant and also used as a scenting material for mouth (5.10.23); a tree adorning *aśokavanikā* (5.14.43); flowering in spring (6.4.79); trees gathered for bridge making (6. 22.59); a tree of Suvela mountain in spring (6.59.3); a tree adorning Rāma's palace garden (7.42.5). *Mimusops elengi* L.

Cooke mentions it as a plant with fragrant flowers used for making garlands; perfume extracted from them. Dist. ravines and evergreen forests of Konkan, Matheran, Khandala RLN. Bakuli.

59. *Pumnaga*: see 23.

60. *Candana*: see 30.

61. *Ketakī*: see 27.

#### DISCUSSION

This detailed study was undertaken in the belief that it is useful to appraise the flora that Vālmikī mentions in his ancient and much acclaimed work which contains quite an appreciable amount of information of plants mentioned as above. Since the geographical area we selected is restricted and its modern identity undoubted, we can be fairly sure that here we have an account of the plant component of the area in Vālmikī's times. We may then compare it to its present plant wealth and carry out several other exercises as well, as hinted below.

However, this belief is tenable only on the following grounds: 1. Whether we are prepared to concede that Vālmikī's account is not just fancy (The so many details regarding several plants shown above are consistent, strictly botanical and not at all fanciful), or the entire work is not just an exaggerated fable (Any close reading of the text would show it to be natural, human and logical; this is particularly so regarding his botanical and cultural information) 2. Whether this *does* have a historical basis and is not a pure poetic fancy? The text rings true always though it is made beautiful with poetry. A few other points of criticisms are that, it does not deserve any serious or scientific study at all, since it is just a concoction. This is a statement that can be made only by those who are unacquainted with the text

in original. Although some practical problems do stem from the fact that there are so many Rāmāyaṇas and these also differ in their texts considerably, therefore which one should one select and how much can one rely upon it? The several Rāmāyaṇas we have are but a testimony to hold that Vālmikī's original *Rāmāyaṇa* had exercised over succeeding generations by grateful devotees. However this does not lessen at all the value or the relevance of the plant wealth of Vālmikī's *Rāmāyaṇa*. The other Rāmāyaṇas are in fact not concerned with this aspect of Vālmikī at all. Most importantly, the text is considered by these critiques as being heterogenous and there is much interpolation so that one cannot be sure as to what exactly was Vālmikī's text. But this is not so and as Gorakhpur edition itself makes it clear, there are largely two versions; the northern and the southern, the latter differing from the former only in that at many places it gives greater elaboration and often exaggeration; but this is concerned with poetic flavour alone and not at all con-founds the botanical aspects. Interpolation can be considered to be a problem in *Mahābhārata* but not in *Rāmāyaṇa*. And, very significantly a single authorship of *Rāmāyaṇa* by Vālmikī has never been doubted by any person of consequence while *Mahābhārata* remains vulnerable to such remarks. *Rāmāyaṇa* provides a consistent and highly naturalistic account of the ancient times from where we can safely cull the cultural and botanical data as a dependable documentary evidence.

The consequence of our study apart from what has been already depicted above in this light, can now be hinted.

1. It offers a 'factual' account of the floristic composition of Pañcavaṭī area in Vālmikī's times – a data invaluable by itself. The total list of the plants is: *Nelumbium* and *Nymphoea* species, *Desmostachys bipinnata*, *Barringtonia racemosa*, *Artocarpus heterophyllus*, *Shorea robusta*, *vanjula* (to be identified), *Lagerstroemia lanceolata*, *Holoptelia integrifolia*, *Madhuca indica*, *Aegle marmelos*, *Diospyros embryopteris*, *Ficus bengalensis*, *Poa cynosuroides*, *Borassus flabellifer*, *Cinnamomum tamala*, *Phoenix* several species, *Calophyllum inophyllum*, *Mangifera indica*, *Saraca indica*, *Wendiandia exerta*, *Pandanus tectorius*, *Michelia champaka*, *Santalum album*, *Nīpā* (to be identified), *Artocarpus lakoocha*, *Anogeissus latifolia*, *Dipterocarpus* several species, *Acacia catechu*, *Prosopis spicigera*, *Butea frondosa*, *Sterospermum suaveolens*, *S. chelonoides*, *Bambusa arundinacea*, *Musa paradisiaca*, *Pterospermum acerefolium*, *Anthocephalus cadamba*, *Terminalia arjuna* and other species, *Syzigium cumini* and *Mimusops elengi*.

2. Vālmikī was not a botanist, neither was his intention to give a botanical account strictly. Whatever botanical data we have is purely incidental and this does not sound fanciful. But it is this very casualness itself of the information that is of great value for, it tells just what existed without any masking or a colouring note.

3. His informations on individual plants from the rest of his *Rāmāyaṇa* as shown above, are of value because they –

- (i) always give additional information,
- (ii) clarify areas of dispute (e.g. information of the several kinds of lotuses),
- (iii) aid in suggesting new claimants for Sanskrit titles on valid grounds (e.g. *Barringtonia racemosa*, as a tree entirely different from *nivara* which is mostly equated to wild rice),
- (iv) show interesting aspects of plant's geography and distribution (e.g. girdle of *Shorea* or *sāla* trees was present around Ayodhyā and Kalinganagara),
- (v) bring out new problems (e.g. to find out equivalents for *vanjula*),
- (vi) deny the synonymy now accepted by some (e.g. *tiniśa* and *syandana*),
- (vii) give ethnic information of the ancient times (e.g. *darbhā* used as a soft seat-spread; *bilva* and *Khadira* for poles used as *yūpas* in *yagñā*),
- (viii) raise some interesting aspects in plant status e.g. since *kadamba* and *dāḍima* are very frequently mentioned by Vālmikī and many other ancient authors as well, should we still regard them as but exotics and grown only under cultivation in India or dismiss this 'evidence' just speciously as being due to interpolation?,
- (ix) bring out wholly new information (e.g. existence of three varieties in *aśoka*, red, yellow and blue and the observation that flowers are born here from root onwards prompting us to re-study whether *Saraca indica* and its now well accepted equivalent can satisfy these criteria) and
- x) occasionally bring out new and now forgotten uses of plants (e.g. using of *pumnāga* or *Callophyllum* to flavour delicious eatables; a similar use of mango flowers is also mentioned).

#### LIST OF ABBREVIATIONS

- BS : Bhāratīya Śanskrit kośa  
 Bh. P. : Bhāva Prakāśa  
 Cooke : Cooke's flora  
 Dist. : (Geographical) distribution of the plant  
 Ety : Etymology  
 Ety-o : No information in the text on etymology  
 K : Krishnamurthy, K.H.



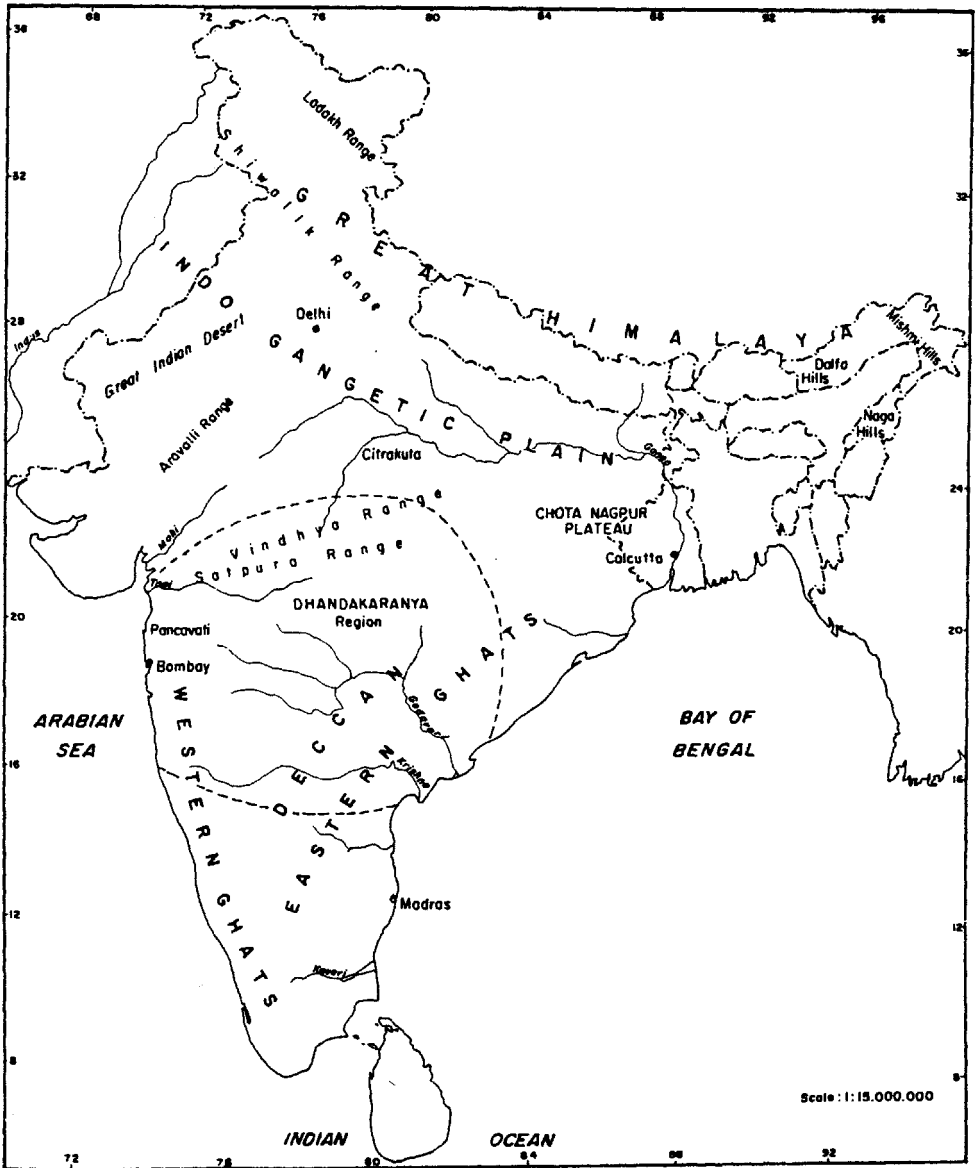


Fig. 1. Location of Dandakāranya and Pañcavaṭī

- KMN : K.M. Nadkarni's *Materia Medica*  
 MW : M. Monier-Williams  
 Pāṇini : Paṇini's *Aṣṭadhyāyī*  
 RLN : Regional Language Names  
 S.Br. : *Satapatha Brāhmana*  
 SJN : Latin and Kannada names by S.J. Narasimhachar  
 TS : *Taittiriya Saṃhitā*  
 VR : *Vālmikī Rāmāyaṇa*  
 VS : *Vājasaneyā Saṃhitā*.

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