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CONTRIBUTION TO THE BOTANICAL IDENTITY OF KADAMBA SPECIFYING VARIETAL CONCEPT IN AYURVEDA

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ABSTRACT

A Study of botanical identity of Kadamba and its varieties has been undertaken in the present work. Textual, botanical and field explanatory aspects have been examined in an attempt to suggest the plant sources *Anthocephalus chipensis* (Lamk.) A. Rich. ex Walp., Mitragyna parviflora (Roxb) Korth. and Haldinia cordifolia (Roxb.) Ridsale for Rajakadamba, Dharakadamba and Dhulikadamba respectively.

Introduction:

In an earlier communication, reports of detailed investigation conducted during 1980 on the Ayurvedic drug Tinduka and its allied plants were made. Presently another Ayurvedic drug is subjected to a study for the purpose of identification with special reference to the classical varieties of the drug.

Kadamba is a commonly known medicinal plant in the indigenous system of medicine which is often mentioned in Ayurvedic Samhitas and other works as for e.g. in Nighantu and Samgraha. It has equal importance in the ancient literature of the country and is a part of our great cultural heritage and religious belief. Patanjali mentions it in his Mahabhasya (4–1–170) and Kalpasutra (Gobhila Grhya 1–5–15), Paraskara Grhya 1–21; Atharva Parisista 26–5–1–5. It was the favourite of classical Sanskrit poets like Kalidasa (Raghuvamsa 13–2, Meghadoota, 1–27; Harshacharita p 39–142; Kadambari p. 354–613). In Valmiki Ramayana, Kadamba is mentioned in various places (Ayodhyakanda, Sarga 94–8/10; floral beauty of mount Chithrakoota; Aranyakanda, Sarga 73–3/5; flora on way to mount Rsyamuka and Pampasarovara; Kiskindhakanda, Sarga 28–34; Rama's description of rainy season etc.) Since the Kadamba is prestigiously associated with Lord Krsna (as well as his brother Balbhadra, also named Hali), vast forests of Kadamba trees were reported to be

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in existence in the region of Vrindavana, between Mathura and Bharatpur, remnants of which can still be seen in this region (M. S. Randhava 1965). The tree is admired for its golden bells of flowers and their delicate scent. In the rainy season, women decorate their coiffures with Kadamba flowers. When planted in large groves, the flowers create a beautiful effect.

Problem

In Ayurveda, Kadamba is considered a useful drug of plant origin having therapeutical utility in a number of diseases. Various preparations of a single and compound nature are known. Kadamba fruits, for instance, are advised to be used as vegetables, fruits and drugs by Charaka (Suthra 27 – 114, 145). Similarly its use is advocated also by Susruta and Vagbhata (Sutra 15–26). Since the time of Susruta and particularly in the Nighantu there is an evolution of the concept of having varieties of Kadamba which was later reflected in the form of a controversy specifically regarding their botanical identity. Review of the previous work done on the subject shows that the kind of drug used has been indicated only with a casual reference with other drugs. It appears that there are no consolidated and detailed study which covers the botanical and Ayurvedic aspects supported with floristic observations and comparative views on Kadamba and especially of the different kinds of the drug in order to establish their identity. The pharmacognostical and chemical studies on the source plants for Kadamba has been given in the reference.

It was therefore considered useful to undertake a pilot study to clarify the botanical identity of the various types of Kadambas using the field data recorded during medico-botanical survey of this plant in its natural habitat.

The pharmaco-dynamics of the drug under study has been given prime importance. These are available in the classical compendia and ancient works on materia medica (Samhita and Nighantus) in different forms and contexts. Pharmaco-dynamics of the major drug Kadamba on the basis of main texts are Rasa-Katu, Tikta, Kashaya; Guru-Laghu, Ruksa; Veerya-Seeta; Vipaka-Katu; Karma-Thridoshanaram, Sukravardhana, Vantihara, Visaghna, Vranasamharanam, Dahaprasamana, Kshara, Stanyajanana, Raktapittahara, Grahi, Muthrajanana, Varnya, Vedanasthapana, Sothahara, Arocakahara. Simultaneously, the medicinal properties of the group of Kadambas in general i.e. Thrikadamba have also been indicated. Katu, Kasaya, Tikta, Pittaghna, Shita, Varnya, Vishahara, Sothahara, Viryavridhikara(Raja Nighantu op. cit.). The particulars given in the Ayurvedic texts on the pharmaco-dynamic aspect show the therapeutical utility and medicinal potentiality of the drug Kadamba and its varieties.

Reference in classical literature

Kadamba is mentioned in early classical texts of Indian medicine as one of the important plant drugs. It has a number of reference in all the those major classical compendia i.e. Charaka samhita, Susruta samhita and Ashtanga hridaya.

A study of Samhita literature pertaining to this particular drug indicate that Kadamba is described in Samhita without any reference to a special

variety or kind and only a few synonyms like Priyaka (S. S. Sutra 25–49; SS, Uttara 47–61) and Nipa (CS Suthra 4–23, 27-142, Vimana 7-22, 8-143, Sarira 8-59; Kalpa 1–15, Siddhi 10–333, S. S. Sutra 6-33, 46-139, 158, Chikitsa 4-32; A. H. Chikitsa 19-81, 20-30, Kalpa 1-7, Uttara 34-2). It has been observed only at a later stage in Susruta. Even here it appears to be synonymous. Dalhana, commentator of Susruta, has interpreted the term "Nipa" by calling it as Dhulikadamba or Mahakadamba and this can be considered only as types of Kadamba. A survey into post-samhita literature particularly Nighantu works shows the beginning of a new concept of describing varieties of Kadamba and also adding ample synonymous terms illustrating the kinds of drug described therein. Among the major authorities of this group, Bhavamisra (Puspa varga 35-36) described Kadamba without any variety but Madanapala (Vatadivarga 5–13) gives indication for two types of Kadamba along with specific synonyms. Kaideva (Oshadhi varga 484-486) incorporates this drug under Nipa or Rajakadamba. It is to be noted that Narahari contributed the final touch to the concept of variety by clearly describing the group of drugs namely Thrikadamba (Prabhadradi varga 102) with common medicinal properties comprising Dharakadamba (of cit. 99) Dhulikadamba (op. cit. 100) and Bhumikadamba (op. cit. 101) possessing specific properties. (op. cit. 97-98). All the important classical quotations and references from Samhitas and Nighantus have been taken into account. Thus it can be seen that varieties of Kadamba were described at a later stage creating confusion and ambiguity which need clarification.

Analysis and discussion

The relevant classical material scattered throughout the original texts (for e.g. Samhita and Nighantus) have been collected and collated. It has been thoroughly examined with special reference to ascertain the botanical identity of the varieties of Kadamba.

It has been observed that four kinds of Kadamba are mainly found in ancient literature. Out of these varieties, Bhumikadamba incorporated among Trikadamba group in Raja Nighantu, actually does not deserve to be in the group of Kadamba. Bhumikadamba finds a separate place in other Nighantu works like Bhavamisra who describes it independently as Mundi, Mahamundi (Guduchyadi varga 216).

Certain synonyms (Paryayas) including Bhukadambika and Kadambapuspika are coined by Bhavamisra, Narahari describes as Mundi/Mahamundi (Sravani /Mahasravani) as an independant drug in another context (Parpatadi varga 19–21) along with seventeen synonymous terms which include Kadambapuspi, Bhukadamba, Nalikadamba. Thus Bhumikadamba or Bhukadamba term is apparently for Mahamundi (Mahasravani) of which *Sphaerenthus indicus* Linn. (Asteraceae) is a well-known botanical source. This spreading small herb possesses compound, globose heads with certain characters which as a whole generally appear like a small receptacle as in case of other Kadamba plants. Thus it is obvious that Bhumikadamba is a synonym for Mundi and it should to be eliminated from the group of

Kadamba as it is clearly seen to be a small or spreading herb and definitely not a tree which is the characteristic of the Kadamba group.

The remaining three classical types of Kadamba i. e. Rajakadamba, Dharakadamba and Dhulikadamba apparently belong to the Kadamba group. The Sanskrit synonyms provided (see table 1) in our ancient literature have been examined in general and further in order to determine the botanical identity of the different types of Kadamba. The plants generally referred in connection with Kadamba are Anthocephalus chinensis (Lamk.) A. Rich ex. wall; Mitragyna parvifolia (Roxb) Korth and Haldinia cordifolia (Roxb.) Ridsale and all these three plants have been collected by the team during medico-botanical survey and their herbarium aspects are listed (table 2).

Attempts have been made to carry out a close study by comparative observation (table 1 & 2, schematic diagram and chart). The basis of botanical and Ayurvedic material provided have been marked with cognate terms in order to trace out clues and find out possible corelationship.

Lexicographical interpretation of classical synonyms provided for each type and all the synonyms have been examined. The salient features and specific characteristics have been compared in order to equate textual indications with the botanical aspect and habitat of the three plants, especially the characters of the different parts and the flowering and fruiting time. During the examinations of different aspects, medicinal properties (Pharmacodynamics) indicated in texts in respect of thrikadambas

SCHEMATIC CHART (TABLE I)

Kadamba and its Varieties

Ethnical, socio-cultural significance/use and costumes/ historical/religious	Flowers and fruits	Others
Lalanapriya (N) — 14 Karnapuraka (N) — 13 Kadambari (N) Nipa (C. S. A.) Halipriya (AK) m Balbhadrasangyaka (N) Haripriya (N)	A. Vrttapuspa (N) — 1 Sindhupuspa (N) — 2 Bhringavallabha (N) Kramukaprasuna (N) Makarandavasa (N) — 6 Bhringapriya (N) — 7 Paragouspi (N) — 8	Kutsitamba (N) Kadambaka (N) Ranukadamba (N) Dhara-Dhuli-Raja-Bhumikadamba Kadamba (C. S. A. N.)
	B. Surabhi (N) — 3 Madadhya (N) — 2 Priyaka (N) — 4	
	C. Pravrsya (N) — 9 Pravssenya (N) — 10 Vasantapuspa (N) — 11 Meghagamapriya (N) — 12	

Abbreviations: C — Caraka samhita, S — Susruta samhita, A — Ashtamga hridaya, AK — Amrakosa, N — Nighantus.

Cognate terms: 1–15 (See table II and note of Sanskrit quotations and references.)

Botanical Aspect of Different Source Plants Examined

	Anthocephalus chinensis (Lamk.) A. Rich ex Walp. A. cadamba Miq. (Rubiaceae)	Mitragyna parvifolia Korth =M. parvifolia (Roxb.) Korth. (Rubiaceae)	Haldinia cordifolia (Roxb.) Ridsale. Adina cordifolia (Roxb.) J. Hooker. ex. Brandis. (Rubiaceae)
Habit	A large deciduous handsome tree with drooping branches	Tree	Handsome shade giving tree
Leaves	Ovate, acuminate, coriaceous shining glabrous above, pubescent beneath.	Orbicular, oval or obvates rounded at the apex or bluntly acuminate cunate rounded or sub-cordate at the base, glabrous/pubescent, coriaceous.	Cordate, orbicular, abruptly acuminate, glabrous above and pubescent beneath.
Flowers	Head single (1) terminal yellow, 1½′ diameter, peduncle 1–1½′ long, corolla glabrous, lobes erect, calyx lobes, oblong.	Crowed in globose (1) axillary or terminal yellows solitary panicle or sub-umbellate herb, calyx tube short 5– toothed, corolla funnel shaped, tube long, valvate.	Densely crowded in solitary or panicled globose head (1) bright yellow or white, calyx tube 5, corolla funnal shaped, tube long, valvate.
Fruit	Pseudo/carp-fleshy receptacle on which numerous closely packed, few seed capsules (13, 14) seed not winged	Fruit of 2 dehiscent coeli many seeded, seed winged endosperm fleshy.	Capsule of 2 dehiscent coeli — many seeded, seed oblong, winged copious.
Wood	Soft; economically useful	Hard, pinkish-brown (harder thus A. cordifolia) economically useful.	Moderately hard, reddish brown; economically useful.
Flowering season	Hot and rainy season (May–July) (9, 10, 12)	June–July (9, 10, 12)	June – July (9, 10, 12)
Fruiting season	October–November	November-January	December-March (4)
Place of collection	Laxmanjhula — South forest (Landsdown forest division) Pauri Garhwal	Nilkanth forests (Bidasance Block (Landsome forest-Division) Pauri Garwal.	Laxmanjhula forest (Landsdown forest Division) Pauri Garwal.
Date of collection	18th October 1981	16th October 1981	15th October 1981
Reference of field collection	N. K. Pandey 26027 G. Pandey 27542	G. Pandey 27436	N. K. Pandey 25929 G. Pandey 27412
Fragrance	Fragrant, when tree is in bloom the odour can be detected from a fairly long distance (2, 3, 4, 5, 6, 7, 8)	—	—
Distribution	From Himalaya to Ceylon and Malaya wild and cultivated Tarai outer hills of Sikkim to 3000 ft.	Tropical Himalaya from Chenali to Burma ascending to 400 ft. and throughout the drier part of India to Ceylon.	Altitude 3000 ft. from Kumaon to Sikkim, throughout the hilly part of India to Ceylon.
Local name	Kadam	Phaldu	Haldu

Cognate term: Certain important feature/character/factors relevant to te minology text of ayurveda (as sketched in table I) are denoted with the numbers 1–15 (in bracked) in the context (See table I and II in cordentation)

in general (Raj Nighantu op. cit.) have been taken into account.

This study finds adequate proof to recommend the plants examined as botanical sources of different classical types of Kadamba. 1. Kadamba – Rajakadamba Nipa – Anthocephalus chinensis 2. Dharakadamba – Haldinia cordifolia and 3. Dhulikadamba Mitragyna parvifolia.

Summary and Conclusion

The present study deals with the problem of the botanical identity of various types of Kadamba, a well-known plant used as a drug in the Ayurvedic system of medicine. Collation of literary material, examination of textual data including interpretation of synonyms and their comparison with the salient features seen in the study of botanical aspect. The observations suggest Anthocephalus chinensis, Haldinia cordifolia and Mitragyna parvifolia as plant sources for Kadamba, Dharakadamba and Dhulikadamba respectively. In addition Bhumikadamba seems to be a synonym for Sravani/Mundi, botanically identified as Sphaeranthus indicus, and is to be excluded from the Kadamba group.

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