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DYEING AGENTS IN INDIA A.D. 1200-1800

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The Indian flora is rich in dye producing plants. The use of vegetable dye was a common practice in dyeing and printing of different kinds of fabrics in medieval India. The various types of plants, their useful parts and the colour obtained from them have been mentioned in Table I. A list of the mordanting agents commonly used in the country is also given in the Table II.

The panorama of the vast Indian subcontinent comprising multiple physiographical regions presents a variegated view of the verdure. Indeed the entire expanse of the country is richly endowed with useful botanical wealth. The northern Kashmir is full of colourful flora, luxurious plants and tall perennial trees. The Indo-Gangetic plane is fit to grow all varieties of the tropical greenery, and the eastern zone is covered with thick vegetation thriving on low alluvial surface and high monsoon record. Equally meaningful is the Thar desert which is nurturing in its large stretches of arid and in parts brackish soil lone or clusters of emaciated babuls (*Accacia arabica*), also including pockets of useful vegetation.

Before the advent of Sultan Mahmud of Ghazni (997-1030 A.D.) in the Punjab, the authorities refer to the popularity of the harmoniously arranged multi-coloured cloths[1], introduction of the aesthetic tie-dye-ing-*tantubandha*[2] and calico printing *chāpa*[3]. In fact patterned fabrics seem to have travelled from the south upwards where these were called *vicitra vastra*[4]. In Jalandhar, the anonymous author of *Hudud-ul-Alam* writing in 982-83 A.D., viewed figured-fabric design as *munaquash*[5] which could well have been painted fabrics. In view of this vertical advance from simple dyeing in primary colours to dyeing in compounded colours, and further on with the introduction of the art of tie-dyeing, painting or printing, it is reasonable to infer that all or almost all progress in the exploitation of the colouring substances from the indigenous vegetation and mineral resources had, by about 1000 A.D., been achieved.

An essential ingredient in dyeing, but more importantly, in the printing craft was the gum *arabica*. Gum has been defined as the substance that secretes, cools and collects on the barks and branches of trees[6]. Out of numerous varieties of gums found in India and recounted in *Majmua-i-ziyai* are *alqasab* (of sugar cane)[7], or *kamashir*[8] (?),

Since deceased December 10, 1990

it was however the *babul* gum, known as gum *arabica* that was used by the dyers and printers of fabrics[9] the *babul* had wild growth in the sandy waterless tracts of the *Thar* desert extending upto Sindh. The Sindh gum was considered the best variety[10] and was also exported overseas.[11]

In order to lend crispness to the dyed/printed material starch-path[12] was commonly used. Prepared from rice, at times with edible salt as the additive[13], starching-*ahar dadan*[14] was about the last operation before final drying and folding of the fabric.

In the Table 1, a list of 27 dyeing agents with characteristic and their details are given. The list is a mere illustrative one, agents such as *qul-i-tori*,[15] *bakain*[16] or *shangraf*[17]-vermillion-have not been included, as these by inference were less commonly used by the medieval Indian dyers. From among the listed ones, eleven alternative varieties were available for each of the two primany colours: red and yellow. For blue, the third primary colour, only two other substitutes are recorded: *Chaukanda* plant and *jamun* (nos. 25, 26. respectively), beside the well known indigo, (No. 11). The occurance of as many as eleven alternative agents for both red and yellow, provided the Indian dyers with a wide range of choice to select a particular agent best suited to his taste, purpose and circumstances. In case he was handling coarse or medium graded fabric he could very justifiably avoid the use of the more expensive lac or lodh, which could more appropriately be used for the costly and less absorbant silks. Similarly, saffron for yellow or indigo for blue could be set aside for silken stuffs, while the moderately graded cotton goods could be, with advantage, treated with the more easily available and almost cost-free substitutes. In fact, it may be attributed to this careful selection of appropriate dyeing agents by the local dyers, that the pre-modern India was always able to save on and accumulate a surplus of the expensive dyeing substances, such as indigo, shell, lac or saffron, and export these abroad and earn handsome profit.

Several plants entered in the Table I yielded more than one dyeing substance. For instance, safflower (no. 2) or *tun* (no. 5) were used to obtain both red and yellow colours. Likewise, both myrabolan (no. 13) and pomegranate (no. 15), perennially yielded substances suitable for yellow pigmentation, on the one hand, and mordanting matter, on the other. This ability to identify the character of the respective property of each part of the plant demonstrates a subtle understanding of the medieval scientific Indian mind. Similarly, without the modern scientific side, equipment and technology, merely on the basis of their empirical knowledge, they had also discovered the variation in the property of different water resources in their region. Thus, they were well aware that the citrous producing areas lent greater lustre to the colours washed in it. For example, in the upcountry red and yellow have brilliant brightness, Thatta-Burhanpur belt could lend brighter sheen to blue and its kindered shades.

Having a single source it could serve more than one purpose, rendered the dyer's job much easier, specially so since the majority of these shrubs and perennials, including that of pomegranate, were of wild growth. In fact with the exception of indigo, shell, lac and saffron, the indigenous and labour free character went a long way

in spurring on the craft and stimulating the dyer to acquire excellent and perfection. Taken together these 27 agents could be compounded into several scores of shades. While Abul Fazl enumerates 33, in the chapter XX of the *Nuskha Khulasatul-Mujarrebat* as 77 hues have been set out. Each of these hues were determined by changing components of the decoction, ratio of the component ingredients and somewhat by altering the mode of processing.

Out of the plethora of vegetational dyeing agents growing in the northern India, principal ones have been enumerated here in Table II, in which their botanical equivalents, habitats, part of the plant yielding the colour, its uses both for pigmentation and otherwise, contemporary observations along with the source for each entry, have been cited.

The Table I shows that it was roghly the region west of longitude 82° that was more richly endowed with potentialities for the extension in dye-yielding plants and perennials. Besides, in addition to the wild growth of several useful varieties, it was particularly noted for the occurance of rare dyeing ingredients, such as indigo, *kikar* and myrabolans. A list of the mordanting agents commonly used in the country is also given in Table II.

List of Abbreviations

A.A.I.	*Ain-i-Akbari,* Vol. I by A. Abul Fazl, tr. Blockman, Calcutta, 1873.
A.A.II.	*Ain-i-Akbari,* Vol. II. by A. Abul Fazl tr. J.N. Sarkar, Calcutta, 1949.
Auboyer	*Daily life in Ancient India* by Auboyer, J., Asia, U.K. 1961.
B. Ajam	*Bahar-i-Aiam* by Tek Chand Bahar, Delhi, 1282 H
Bayaz	*Bayaz-i-Khushbui,* Anonymous, I.O.L, London Ms.
Buchanan	*An Account of the Districts of Bihar and Patna* by Buchanan Jamilton, Patna and Calcutta.
Dastur-ul-Afazil	*Dastur-ul-Afazil* by Hajih Khairat, Delhi, Tehran, 1973.
De Leat	*The Empire of the Great Mughal* by De Leat, Bombay, 1928.
Downton	*The Voyages of N. Downton in the East Indies* 1614-1615, Hakl. Society, London, 1939.
E.F.	*The English Factories in India,* 1618-21, 1630-33, 1637-41, 1646-50, by W. Foster, Oxford, 1909-27.
Fawdid	*Fawdid ul Insan* by Fidai Dawani, Tughlaqabad Ms.
Finch, W.	*Early Travels in India* 1583-1619, by Foster, W. Oxford, 1921.
Fitch	*England's Pioneer to India,* ed. by Ryley, London, 1899.
Gerard	Historie of Plants by Gerard, J., London, 1597
Hoey	*A Monograph on Trade and Manufactures in Northern India,* by Hocy. W, Lucknow, 1880.
Ibratnama	*Ibratnama* by Khairuddin Lohori, ed. Md. Baqar Lohare, 1961.
Indo Aryans	*The Indo Aryans* by R.L. Mitra, Calcutta, 1969.

JASB	*Journal of Asiatic Society of Bengal*, Calcutta.
Jones	*Asiatic Researches* ed. Jones, W. Vol. V, Calcutta.
Khazain	Khazain-ul-Futuh by Amir Khusru, Calcutta, 1953.
Liotard	*Memorandum on the Dyes of Indian Growth and Production*, by Liotard L., Calcutta, 1881.
Marco Polo	*Travels of Marco Polo* ed. Marsden, London, 1818.
Mazhar	*Mazhar-i-shahjahani*, by Yusuf bin Mirak, Haiderabad (sind), 1962.
Mundy	*The Travels of P. Mundy in Europe and Asia, 1608-67, Travels in Asia 1628-34*, Vol-II, Haki Society Series, London, 1914.
Naqvi	*Urban Centres and Industries in Upper India* 1556-1803 Bombay, 1969.
Nuskha	*Nuskha Khulasatul Mujerrabat*, Anonymous, I.O.L, London, Ms.
O'Conor	*Note on Lac* by O'Conor, J.E., Calcutta, 1874.
P. Indica	*Pharmacgraphica Indica-A History of the Principal Drugs-Vegetable origin*, by Dymock, Wardon, Hopper. Vols. I & II, Delhi, n.d.
Palsaert	*Jahangir's India*, by Palsaert, F., tr. Moreland and Geyl, Cambridge, 1925.
Pesha	*Ferhang-i-latelahat-i-pesha-waran*, Vol. II by zafarur Rehman, Delhi, 1940.
Rehlah	*Rehlah* by Ibn Battuta, tr. Mehdi Hussain, Baroda, 1953.
Roe	*The Embassy of T. Roe to the Court of Great Mogul* 1615-19, ed. W Foster, Royal Society, London, 1899.
Saidna	*Kitab ul Saidna fil Tibb by Alberuni*, A.R., tr. Karachi, 1973.
Sirajul Majalis	*Swiraj ul Majalis* by Muhammad Ahmad Miren, Rampur Ms.
Sirat	*Sirat-i-Firoze Shahi*, Anonymous, Patna Ms.
Tibla	*Tibla-i-Sikandari* by Bhawa bin Khawas Khan, Tughalaqabad Ms.
Tibb i Amti	*Tibb-i-Amti*, Anonymous, National Museum, Karachi.
Wardle	*Monograph on the Tusser and other wild silks of India and on the Dyestuffs and Colouring Matters of India* by Wardle T., London, 1878.
Watts	Pambhlet on Indigo by Watts, G., I.O.L., (25) 2235.
Watters	*On Yuan Chwange Travels in India* by Watters, T., New Delhi, 1973.
Withington	*Early Travels in India* 1583-1619, by Foster W., Oxford, 1921.
Zakhira	*Zakhira-i-sariat O Hirfah* by M. Aham, Lahore, 1905.
Ziyai	*Majimu-i-Ziyai* by Zia Muhammad Umar Ghaznavi, Tughlaqabad Ms.

NOTES AND REFERENCES

[1]Chandra, M. *op. cit.*, pp. 21-27.
[2]*Op. cit.*, p. 22.
[3]*Op. cit.*, p. 23.
[4]Ibid.
[5]Anonymous, Hudud-ul-Alam, ... p. 89.
[6]*Zia Md. Umar Ghaznavi, Majmu'a-i-ziyai*, Tughlaqabad Ms. f. 183a.
[7]*Op. cit.*, 177a.
[8]*Op. cit.*, 185b.
[9]Alberuni, A.R., *Kitab-ul-saidna-Fil-Tibb., tr. Karachi, 1972, p. 206.*
[10]*Op. cit.*, 120.
[11]Fostar, W., *The English Factories in India*, 1637-41, Oxford pp. 198-99; Tavernier, L.B. *Travels in India*, tr. London, 1989, Vol. II., p. 22.
[12]Khusru A., *Ejaz-i-Khusruni*, Vol. IV., Lucknow, p. 194.
[13]Anonyumous, *Bayaz-i-Khushbui*, I.O.I., London, Ethe, 2784, f.120a.
[14]Fakhruddin Qawas Ghaznani, *Farhang-i-Qawas*, Tehran, 1973, p. 182; Anonymous, *Nuskha Khulasatul Majerrabal*, I.O.I., London, f.123A, passim.
[15]Ghaznani zia Md., Umar, *Majmu'a-i-ziyai*, Tughlaquabad Ms. f. 125b.
[16]*Op. cit.* 126b,
[17]Anonymous, *Bayar-i-Khushbui*, I.O.L., London, Ethe, 2784, f. 122a.

TABLE I
SOME COLOURING AGENTS

Agent-Plant: Botanical Names		Source
1. Al *Morinda tinctoria* (P. for dyeing the root of a tree).	(A) PROVENANCE	
	In the Subah of Allahabad, Kara and Jajmau	*A.A.* II. 92
	In Agra subah Eraj, Kalpi and Phapund	*A.A.* II. 99, 101
	In Awadh, Ranipur, Hathras	*Liotard*, 51
	In Awadh, Bandi,	*Wardle*, 30;
	Extensively grown in Malwa	*P. Indica*, II, 226, 227
	(B) COLOUR OBTAINED	
	Red and yellow	*M. Afazil*, 1,35
	Red	*B. Ajam*, 1, 48
	Bright red	*Wardle*, 30
	Red	*P. Indica*, II, 226.
	(C) PART YEILDING THE HUE	
	Stem, but that of the root of the bark is of brighten shade	*Liotard*, 51
	Root of the tree	*B. Ajam*, 1,48.
	(D) USES-DYEING/PRINTING	
	Fabric dyeing	*Nuskha*, 126a-b, 134a-b
	Dyeing carpet bands	*Wardle*, 30
	Kharwa cloth-plain dyeing	*JASB*, II, 1833, p. 158; also *Sirajul Majalis, 164.*
	For printing fabric	*Liotard*, 51.
	To dye bags (Kharita) of dazai or velvet	*B. Ajam*, 1,48
	For dyeing paper	*Bayaz*, 114b, 115a. etc.
	(E) OTHER USES	
	Leaves and fruit for medical purposes	*P. Indica*, 11,226.
	(F) REMARKS	
	Exported abroad.	*B. Ajam*, 48.
	Permanent colour	*Hoey*, 167
	Bright red colour	

Agent-Plant: Botanical Names		Source
2. Gul i masfar, safflower: *Carthamous-tinctorius*	(A) PROVENANCE	
	Around Kusumpura-near Magadh	*Watters*, 11, 87.
	Occurs in India — all over	*Saidna*, 227, also *Zaiyai*, 127b, 183a, 184b, etc.
	Punjab produced it	*Ibratnama*, 1,38.
	Occurs in Sind	*Hughes*, 11, 526.
	In Agra, Delhi, Allahabad Oudh, Lahore, Multan, Malwa.	*A.A.* II, 76, 79, 82, 84, 86, 87, 89, 97, 105, 107, 114, 116.
	Common product of India	*Tibb*, 36a
	(B) COLOUR OBTAINES	
	Red dye	*Saidna*, 228;
	Red dye	*Bayaz*, 111a-b
	Yellow dye, also red of luminous shade, rose, scarlet, crimson	*Liotard*, 26.
	Red bright shade	*Ibratnama*, 1,38
	Yellow & red dye.	*B. Ajam*, 11,613.
	(D) USES-DYEING/PRINTING	
	Flowers	*B. Ajam*, 11, 613; *Liotard*, 26;
	(D) USES-DYEING/PRINTING	
	Fabrics,	*Liotard*, 26.
	To dye fabrics	*Ibratnama*, 11, 38.
	To dye paper, ivory, fabrics.	*Bayaz*, 111a, 112b.
	To dye fabrics	*Saidna*, 227
	In Sind it was popular since antiquity.	*M. Shahjehani* p. 184
	(E) OTHER USES	
	Medicinal use of its Juice of leaves, flowers & seeds	*Ziyai* 127b, 183b, 184a, 189b, 196a.
	medicinal use.	*F. Insan*, 19a *Tibb*, 25a; *P. Indica*, II, 308, 309.
	Oil extracted from seeds	*Tibb*, 25a *Ziyai*, 188b, 209b

Agent-Plant: Botanical Names		Source
	(F) REMARKS	
	Called Baharman/Babarnama, by Alberuni; latter in the veriety reason	*Saidna*, 228
	Fugitine by nature.	*Hoey*, 167.
3. **Shahab (bastard saffron) red juice from the flower of the Kajera (i.e. bastard saffron)**	(A) No information available	
	(B) COLOUR OBTAINED	
	Red but generally used for compounded shades	*Nuskha*, 125a; 124, 131a, 117a-b, etc.
	Red but used for compounded shades	*Bayaz*, 112a, 112b, 113a, 114a, 114b, 118a, 118b, etc.
	Again red for compounded Shades	*Liotard*, 26.
	(C) No information available	
	(D) USES-DYEING/PRINTING	
	For dyeing cotton goods	*Nuskha*, 121b-122a, 117a-b, etc.
	For dyeing paper.	*Bayaz*.
	(E) No information available	
	(F) REMARKS	
	Red juice from the plant *Kajira* Stemgrass.	
	In two varieties (one of these was shahab) is khasa	*Nuskha*, 117a-b, 124a, etc. *Bayaz*, 112a.
	Very frequently used	*Nuskha*, 121b, 122a, 117a-b, 125b, 125b-126a etc.

Agent-Plant: Botanical Names		Source
4. Majetha-madder *Rubia cordifolia*	(A) PROVENANCE	
	All over, but Oudh, Mau Ranipur, Hathras in particular	*Liotard,* 50-51
	In upper sind	*Hughes,* 11,626.
	(B) COLOUR OBTAINED	
	Red	*Dastur ul-Afazil,* 139; *Watters,* 11, 148; *Liotard,* 50; *P. Indica,* 11, 227; *Hughes,* 11, 626.
	(C) PART YEILDING THE HUE	
	Both the root & stem contain the dye, that of root is lighter.	*Liotard,* 50.
	(D) USES-DYEING/PRINTING	
	For dyeing fabrics	*Dastur-ul-Afazil* 139; *R. Fitch, Foster,* 34;
	For dyeing yarn	*R. Fitch,* Foster, 34
	For printing calicoes.	*Liotard,* 50; *Hocy,* 168.
	(E) No information available	
	(F) REMARKS	
	Three varieties, common, Kabuli and Khushrang	*Nuskha,*
	permanent colour	*Hoey,* 167.
	For botanical details	*Gerard,* 956-58.
5. Tun *Cedrela tuna*	(A) PROVENANCE	
	Western & Northern U.P.	*Liotard,* 82.
	(B) COLOUR OBTAINED	
	Red	*Liotard,* 82; *Hoey,* 166; *Nuskha,* 132b, 133a, 134a.
	Yellow	*Liotard,* 82
	Fine yellow	*W. Jones,* 122

Agent-Plant: Botanical Names		Source
	(C) PART YEILDING THE HUE	
	The seeds of the flower	*Liotard*, 82
	and also the flower.	
	Flower	
	Leaves	
	(D) USES-DYEING/PRINTING	
	For dyeing cotton cloth	*Nuskha*, 132b, 133a, 134a.
	(E) No information available	
	(F) REMARKS	
	Used sparingly	*Hoey*, 166-67
	Also called vilaytinim	*W. Jones*, p. 122, vol. c.
6. Lakh: *Coccus lacca*	(A) PROVENANCE	
	All over, native to India.	*Gerard*, 1349-50; *O'Conor*, 6
	Agra, Surat	*E.F.* 1618-21, 84
	Punjab, Oudh	*Liotard*, 32
	Bihar	Buchanan, 11,649
	Sind	*A.A.* II, 91; *Wardle*, 34; *Memoir*, II, 298,612.
	(B) COLOUR OBTAINED	
	Red, bright,	*Hocy*, 40;
	Brilliant scarlet	*Wardle*, 20; *Gerard*, 1349;
	Red & purple	*Auboyer*, 82
	(C) PART YEILDING THE HUE	
	A resinous incrustation, formed on the bark of trees by the lac insect so that it was really on aniline product.	*O'Conor*, p. 1;
	(D) USES-DYEING/PRINTING	
	Used for dyeing silken goods	*O'Conor*, 27 *Liotard*, 32 See *Wardle* 32.

Agent-Plant: Botanical Names		Source
	(E) OTHER USES	
	Employed to dye paper to	*Bayaz*, 123b)
	dye cheap trinkets	*O'Conor*, 26)
	Employed by the linners painters on paper, for perfect crimson colour	*Gerard*, 1349)
	For dyeing leather	*O'Conor*, 27; *Wardle*, 34.
	For dyeing lady's feet	*Mittree*, 102,107,108,112.
	Shell lakh used for varnishing, japaning & sealing wax	*Hoey*, 40.
	(F) REMARKS	
	In two varieties stick & *shell lakh*,	*Wardle*, 22; *Hocy*, *40*, *Buchanan*, II,649.
	The cost of the superior Surat lakh called Chapra used to be about 12—mahmudis-about Rs. 7-per maund.	*Buchanan*, II, 649 *E.F.* 1618-21, 84
	Abundantly produced in Sind and of good quality	*Hughes*, 11, pp. 298, 612.
	Extensively produced in Lucknow, the insect is artificially propagated in Jungles in the north of Oudh specially in Gonda and Bahraich.	*Hoey*, 40
7. **Patang-Sapan-weed:** ***Caesalpinia***	(A) PROVENANCE	
	In the South of India	*Rehlah*, 192
	(B) COLOUR OBTAINED	
	Red	*Liotard*, 24,25
	(C) PART YEILDING THE HUE	
	Wood of the tree though pak in colour turned red when exposed to the air	*Liotard*, 24

Agent-Plant: Botanical Names		Source
	(D) USES-DYEING/PRINTING	
	used in dyeing cotton fabrics but ordinarily with additives.	*Nuskha,* 134a 132b, 133a; *Hoey,* 167; *Liotard,* 119, 120.
	(E) OTHER USES	
	Used for making gulals-*vermillion.*	*Bayaz, 122a; P. Indica,* 1,500.
	(F) REMARKS	
	Fugitive shade	*Hoey,* 167; *Liotard,* 24.
8. Kachnar: *Bauhinia variegata*	(A) PROVENANCE	
	Off common occurance.	*A.A. 1.66.*
	(B) COLOURS OBTAINED	
	Red	*Nuskha,* 130b
	Pink-fired	*Nuskha,* 125b
	(C) PART YEILDING THE HUE	
	Bark	*Nuskha,* 130b
	(D) USES-DYEING/PRINTING	
	For dyeing cotton goods	*Nuskha,* 130; *Wardle,* 17.
	(E) OTHER USES	
	Medicinal use.	*P. Indica,* 1,536.
	(F) REMARKS	
	Used for obtaining yellow too	*Wardle,* 67.
9. Loth: *Symplocasrace mosa*	(A) PROVENANCE	
	Kumaon hills	*Wardle,* 34.
	(B) COLOUR OBTAINED	
	Red-deep crimson dye	*Wardle,* 34.

Agent-Plant: Botanical Names		Source
	(C) PART YEILDING THE HUE	
	Middle layer of the bark.	*Wardle* 34; *P. Indica*, 11,373.
	(D) USES-DYEING/PRINTING	
	For dyeing silken stuff	*Wardle*, 34.
	(E) No information available	
	(F) REMARKS	
	Expensive, 4ars per rupee (in the 19th century).	*Wardle*, 34.
10. Pista: *Pistachia vera*	(A) PROVENANCE	
	Punjab, W.U.P. and N.West.	*Liotard*, 11; Wardle, 32
	(B) COLOUR OBTAINED	
	Red	*Wardle*, 32.
	(C) PART YEILDING THE HUE	
	Flowers and galls	*Wardle*, 32
	(D) USES-DYEING/PRINTING	
	For dyeing silks	*Wardle*, 32.
	(E) No information available	
	(F) No information available	
11. Indigo-Nil *Indigofera tinctoria*	(A) PROVENANCE	
	Native to India.	*Saidna*, 229 *Gerard*, *B. Ajam*, II, 737.
	All over the country from Lahore to Awadh	*A.A.* II, 78, 81, 83, 86, 88.
	Boana, Hinaluem the best, in Sind	Pelsaert, 13; *W. Finch*, Foster, 152; I, 89; *M. Shahjahani*, 183.
	Koil, Multan & Sind	op. cit, 1790. *Memoir*, 11, 626

Agent-Plant: Botanical Names		Source
	Sarkhej	Roe, 76; Wittington, Foster, 218; E.F. 1637-44, 274; *M. Shahjahani*
	Mewat	*Pelsaert, 15*
	Khurja	*Pelsaert*, 15, W. Finch, op. cit. 179; De Leat, 46; E.F., 1646-51, 225; 1655-60-63
	Lalsot	Mundy, II, 235
	Sarkhej (in Gujarat)	Marco Polo 961; *A.A.* II, 115; Finch, Foster 115; De Leat, 23; Downton, 110, 111:
	(B) Colour Obtained	
	Blue, its kindered shades	*B. Ajam*, II, 738 *Nuskha*, 119a-b, 125b-126a; *Watt, Indigo*, 11; Wardle, 27; *Hoey*, 165 *Liotard*, 97. *Bayaz*, 114b, 122a; *P. Indica*, 1, 406, 407.
	(C) Part Yeilding The Hue	
	Leaves of the plant Flowers too	*Bayaz*, 115a, 47a, 117b.
	(D) Uses-Dyeing/Printing	
	For dyeing cotton goods	*B. Ajam*, 11,737-38; *Nuskha*, 119a-b, 125b-126a; *Watt* 77,78; *Liotard*, 120 *Memoirs*, 4, 740.
	For printing fabrics	*Watt*, 79; *Nuskha* 135a.
	(E) Other Uses	
	Used for vernishing.	*A.A.* I. 237.
	Flowers for medicinal purposes	*Bayaz*,
	Flowers and seeds for medicinal purposes.	*Tibb*, 25b

Agent-Plant: Botanical Names		Source
	For dyeing paper	*Bayaz*, 114b.
	For painting leather ware	
	for painting wood ware	
	For painting etc.	*A.A.* I. 237.
	(F) REMARKS	
	Indigo in two varieties, wild, called *doodhi* and the usual cultivated one.	*Pesha* 40
	Indigo dyed cloth is attested to in the Upaniṣads & Sūtras (c. 800-300 B.C.)	*Mittree*, *IJHS*, 1, May, 1970;
	Fugitive by nature.	*Indo-Aryans*, 1, p. 176. *Watt, Indigo*, 77
	An expensive commodity, Was largely exported. Indigo making (nilgari) had become a regular profession	*Naqvi*,
12. Turmeric: *Curcuma longa*	(A) PROVENANCE	
	Universally grown in India.	*Saidna*, 224; *Ziyai*, 196; *Tibb*. 83b, 91a *A.A.* 11,72,75,78,80, 82; *Liotard*, 83; *Hoey*, 167.
	(B) COLOUR OBTAINED	
	Yellow	*Nuskha*, 116b; etc. *Liotard*, 83; *Wardle*, *23; F. Insan*, 86a;
	(C) PART YEILDING THE HUE	
	The tube of the plant.	*F. Insan*, 68a; *Ziyai*, 96b; *Liotard*, 83. *P. Indica*, III, 409.
	(D) USES-DYEING/PRINTING	
	For dyeing cotton goods yellow and of shades compounded with turmeric.	*Nuskha*, 116b, 117b, 128b-125a;

Agent-Plant: Botanical Names		Source
	(E) OTHER USES	
	Medicinal uses.	*Tibb*, 83b, 91a,; *F. Insan*, 86a-b; *Ziyai*, 27b, 29b, 58a, etc. *P. Indica*, 111, 410-11; *Bayaz*, 30a, 33b, 34b, etc.
	To make vermillion-*qutal*	Bayaz, 122b.
	A popular spice ingredient of Indian curries & other dishes.	*A.A.* 1. 64;
	(F) REMARKS	
	Zard choba, darhald, 2 varieties,	*Ziyai*, 196b,
	In two varieties large and small	*F. Insan*, 86a *P. Indica* also
	A third variety	*P. Indica*, III, 396-97.
	Zawil too is noticed	*Nuskha*, 116b, Zawli was a town in Persia.
	A fugetive colour	*Wardle*, 23; *Liotard*, 83.
	Commonly used since antiquity.	
13. Myrabolan (har) *(Halila)*	(A) PROVENANCE	
Terminalia chabula	Indian Tableland.	*P. Indica*, 11, p.1
Terminalia ballerica	2nd variety all-over India.	*P. Indica*, 11, p. 5
Terminalia arjuna	3rd "N.W. Provinces and Deccan	*P. Indica*, 11. p. 11.
	An Indian ingredient	*M. Afazil*, 1, 234 *Tibb*, 25a, 83b. 180-23
	(B) COLOUR OBTAINED	
	Bright yellow from the 2nd veriety	*Liotard*, 70; *Watt*, *Commercial*, 1072;
	Dingy yellow colour	Wardle, 35. *Liotard* 17,
	(C) PART YEILDING THE HUE	
	Bark and Galls	*Wardle*, 35
	Rind of the fruit	*Liotard* 17,
	Its leaves are yellow	*Ziyai*, 186b

Agent-Plant: Botanical Names		Source
	(D) USES-DYEING/PRINTING	
	For dyeing cotton goods.	*Nuskha*, 122 b 124b, 124b-125a.
	For printing yellow motifs	*Wardle*, 35
	For dyeing carpet yarn	*Wardle*, 35;
	(E) OTHER USES	
	As an astringent.	*Saidna*, 184;
	Medicinal uses	*Ziyai*, 27b, 28a, 29a, 58a, etc. *Tibb*, 83b, 306a, *F. Insan*, 23a-b; *Sirat*, 169a, 171a, 172a, 173b etc.
	For sherbat Wine.	*Ziyai*, 147a Ziyai, 150b
	Oil	Ziyai, 188a
	As a preserve (murabba)	*Saidna*, 42
	Rind used for	
	(F) REMARKS	
	In more than one variety	*Sirat*, 175a;
	Kabule.	*Bayaz*, 125a
	Passes through Air stages	*P. Indica*, II, p.2,
	of maturity-Valilai, Zira	For Kabuli also
	Jawi, Zangi/Hindi, Chini	*Ziyai*, 170b.
	Asfar and Kabuli	
	One of the basic medicinal	See *Ziyat*, passim
	ingredient of the period	*Tibb*, passim,
14. Dhoa: *Grisleatomentosa*	(A) PROVENANCE	
	Grows all over the country	*Liotard*, 46
	(B) COLOUR OBTAINED	
	Yellow	*Wardle*, 26; *Liotard;* 46
	(C) PART YEILDING THE HUE	
	Flowers contained dye.	
	(D) No information available	
	(E) No information available	
	(F) No information available	

Agent-Plant: Botanical Names		Source
15. Pomegranate (anar) *Ponica granatum*	(A) PROVENANCE	
	Grown all over, also in greater abundance in the north west.	*Gerard*, 1261-63; *Liotard*, 12 also *A.A.* 1.69
	Occurs in the upper Sind hills	*Memoirs*, 1,126
	(B) COLOUR OBTAINED	
	Yellow-Greenish dye Deep Yellow & its Shades	*Liotard*, 73 *Liotard*, 13; *Wardle*, 32
	(C) PART YEILDING THE HUE	
	The yielded the dye.	*Liotard*, 13
	(D) USES-DYEING/PRINTING	
	Used in dyeing cotton *fabrics*	*Nuskha*, *Passim*
	(E) OTHER USES	
	Used as a mordanting agent	*Saidna*, 229; *Nuskha* 115a-b, 116b-117a, 119a-b, 130b,
	For medicinal use	*Surat*, 171a, 174b, *Ziyai*, 53b, 56a, 56b its rind
	Good for the heat	*Ziyai*, 197b.
	(F) REMARKS	
	In two varieties, inferior quality better suited for dyeing.	*Liotard*, 12.
	Perhaps it was the superior variety which cost Rs. 6½ to 15/- a mound.	*A.A.* I.69.
16. Har Singhar *Nyctanthes arborists*	(A) PROVENANCE	
	Found every where.	*A.A.* I 81 *Liotard* 59; *Hoey*, 166.
	(B) COLOUR OBTAINED	
	Yellow	*Liotard*, 59

Agent-Plant: Botanical Names		Source
	(C) PART YEILDING THE HUE	
	The orange coloured staks	*A.A.* I.89; *P. Indica,* II, 377.
	(D) USES-DYEING/PRINTING	
	Used for dyeing silks	*Liotard,* 59.
	(E) No information available	
	(F) No information available	
17. Zafran (Saffron) (Kesar in Hindi, Saidna, 166)	(A) PROVENANCE	
	In Kashmir	*A.A.* I. 80
	(B) COLOUR OBTAINED	
	Yellow-bright	*Bayaz,* 44b, 115a *B. Ajam,* II, 24.
	(C) PART YEILDING THE HUE	
	Dried stigmas.	*F. Insan,* 33a.
	(D) No information available	
	(E) OTHER USES	
	Medical uses	*Saidna,* 166; *Ziyai,* 27b, 32b, 36a, 39b, etc.; 187b, *F. Insan* 34, b-35a, 103a; *Sirat,* 172a, 175b, etc.; *Bayaz 15a, 17a, 18a, 18b, etc.*
	For dyeing paper	*Bayaz,* 111b, 112a, 112b 114b, 155b.
	For oil making	*Ziyai,* 184b.
	In soap making	*Bayaz, 9b, 12a, 13a, etc.*
	For sherbat	*Ziyai,* 140a, 141a-b, 143a-b.
	(F) No information available	
18. Hana: *Lawsonia inermis*	(A) PROVENANCE	
	All over the country	*A.A.* II, 8,17,26,32 36, 41, 46, 91.

Agent-Plant: Botanical Names		Source
	In Sind	*Idrisi*, E.D. 1, p. 85.
	(B) Colour Obtained	
	Deep orange dye	*Liotard*, 47.
	(C) Part Yeilding The Hue	
	Leaves	*Liotard*, 47
	Leaves	
	(D) Uses-Dyeing/Printing	
	In dyeing cotton goods	*Nuskha*, 122a-b, 133a *Ziyai*, 155a
	(E) Other Uses	
	To extract perfume	*F. Insan*, 41a; *Tibb-i Amli*, 213b,; *A.A.* 1
	Used as a hair dye	*Saidna*, 205; *Ziyai*, 52b *Bayaz* 124b.
	Used to dye feet	*Watt.* 706, 707
	Used to dye hands.	*Khazain*, 47;
	Medicinal uses	*F. Insan*, 41a; *Tibb-i Amli*, 213, *Sirat*, 173b
	(F) No information available	
19. Bil: *Aegle marmelos*	(A) Provenance	
	Native to India all over.	*P. Indica*, 1, 77.
	(B) Colour Obtained	
	Yellow dye	*Liotard*, 77; *Wardle*, 14.
	(C) Part Yeilding The Hue	
	Pulp of the fruit.	*Liotrad*, 77
	(D) No information available	
	(E) Other Uses	
	Astringent properties	Wardle, 14
	Medicinal properties	*Tibb*, 38a; also *Ziyai*, 177b, 198a.
	(F) No information available	

Agent-Plant: Botanical Names		Source
20. Dhak: *Butea frondosa*	(A) PROVENANCE	
	Wild growth-trees	*Liotard*, 77.
	In Sind	*Memoirs*, 599.
	(B) COLOUR OBTAINED	
	Yellow dye	*Liotard*, 77
	Red bright dye	*P. Indica*, 1, 457
	(C) PART YEILDING THE HUE	
	Flowers	*Liotard*, 77
	Flowers	*P. Indica*, 1,457
	(D) No information available	
	(E) OTHER USES	
	Astringent properties.	*P. Indica*, 1,456.
	Also yields gum & lac	*P. Indcia*, 1, 455.
	(F) No information available	
21. Babul-Kakar *Accacia arabica*	(A) PROVENANCE	
	Wild growth (even in arid areas)	
	(B) COLOUR OBTAINED	
	Brown	*Wardle*, 14; *Hughes*, 11, 611.
	(C) PART YEILDING THE HUE	
	Bark, and leaves too were used to obtained the dye	*Wardle*, 14;
	Bark yielding shades of brown	*Mughes*, 11, 611.
	(D) USES-DYEING/PRINTING	
	In colouring cotton fabrics brown	Nuskha, 124b, 123a-b; *Hoey*, 168.
	(E) OTHER USES	
	Best variety of gum	*Saidna*, 120; F, *Insan*, 111b.
	Medicinal uses (of the gum)	*Sirat*, 173a; *Ziyai*, 39b

Agent-Plant: Botanical Names		Source
	(F) REMARKS Its colour is transient, can be fixed by adding lime and catechu	*wardle*, 14
22. Akilulmulk (aghway)	(A) PROVENANCE of Indian origin	M. Afazil, I, 116. asparak in Hindawi *Ziyai*, 175a
	(B) COLOUR OBTAINED Yellow Yellow	*M. Afazil*, 1,116. *Ziyai*, 175a
	(C) PART YEILDING THE HUE Grass	
	(D) USES-DYEING/PRINTING For dyeing silken yarn Yellow	*M. Afazil*, 1,116
	(E) OTHER USES For its medicinal uses.	*F. Insan*, 12b-13a *Ziyai*, 175a
	(F) REMARKS No information available.	
23. Catechu (katha): *Accacia catechu*	(A) PROVENANCE Bihar, Delhi, India India (Hindawi)	*Watt*, 9; *Wardle*, 14 *P. Indica*, 1, 557 *Ziyai*, 184b.
	(B) COLOUR OBTAINED Brown	*Liotard*. 8-9;
	(C) PART YEILDING THE HUE Catechu is obtained as a deposit upon twigs placed in the liquid extract	*P. Indica*, 1,577.

Agent-Plant: Botanical Names		Source
	(D) USES-DYEING/PRINTING	
	For dyeing silks brown.	*Wardle*, 14; also *Hoey*, 168; *Nuskhal* 123b
	(E) OTHER USES	
	As an essential ingredient of pan	
	For its medicinal uses	*Ziyai*, 184b.
	(F) REMARKS	
	In two varieties: the dark shaded and the light shaded the latter papariya is chewed with pan	*P. indica*, 1,557; *Wardle*, 47
	Indian catechu is black coloured	*Ziyai*, 184b.
	Fugitive colour, can be fixed with lime	*Liotard* 8-9
24. Imli (tamarind) *Tamarindus indica*	(A) PROVENANCE	
	Native to India-Especially. noticeable on the banks of rivers Ganges, Jamuna, Sind.	*P. Indica*, 1, 532; *Liotard*, 14,15
	(B) COLOUR OBTAINED	
	Black dye was obtained by adding form iron salts.	Coenrdonk, *JITH*, III, 1957, pp. 26-27.
	(C) PART YEILDING THE HUE	
	Galls of the tamarind	*Liotard*, 14, 15, *Ziyai*, 178a for the galls.
	(D) USES-DYEING/PRINTING	
	All the mader dyed cloth were to the soaked in it but used mainly in calico printing	*Liotard*, 15.
	(E) OTHER USES	
	An article of diet	*P.Indica*, 532 *Tibb*, 36a; *Saidna*, 229

Agent-Plant: Botanical Names		Source
	(F) REMARKS In varieties-the small seeded one and the redish & brown.	*P. Indica* 1, 532.
25. Jamun: *Eugenia jambolana*	(A) PROVENANCE Native to India	
	(B) COLOUR OBTAINED Blue used with indigo	*Wardle*, 25
	(C) PART YEILDING THE HUE Fruit	
	(D) USES-DYEING/PRINTING To dye cotton yarns blue	*Wardle*, 25
	(E) No information available	
	(F) No information available	
26. Chankanda: *Cassia tora* Spikenard	(A) PROVENANCE Abounded all over the Country. So cosn. of Lahore, Nurpur.	*Wardle*, 20 W. Finch, Foster, 1968, p. 179.
	(B) COLOUR OBTAINED Blue-as a good substitute for indigo.	*Wardle*, 20
	(C) PART YEILDING THE HUE Seeds	*P. Indica*, I, 516
	(D) USES-DYEING/PRINTING Used for blue colour for	*Wardle*, 20
	(E) OTHER USES Some medicinal properties.	*P. Indica*, 1,516
	(F) No information available	

TABLE II
SOME MORDANTING AGENTS IN MEDIEVAL INDIA

S.No.	*Mordants*	*Habitat*	*Remarks*	*Source*
1.	Lemon	Mansura in Sind Broach in Gujarat	Large fields largely used	Istakhri, Hauqal, *E.D.* I, pp. 27,38; *Ziyai*, 44a-b, 192a. *E.F.* 1646-51, pp. 56, 106.
2.	Orange	India		*Saidna*, 15; *Ziyai*, 197b.
3.	Mangoes	Sind India		Hauqal, *E.D.* I.p. 38. *Saidna, 15; Ziyai*, 132b, 191b; *Nuh*, pp. 90, 160.
		Muthra	2 Kinds Raw ones used	Watters, I.p. 301. *Infra*, chap. II.
4.	Tamarind	India	Astringent	*Saidna*, pp. 15, 204, 229.
5.	Kirpas	India	Flowers used	Wardle, 26; *Nuskha*, 115b, 118b.
6.	Anola	India	Also exported	*Saidna*, 42; *Ziyai*, 27b, 29b, 192b.
7.	Myrabolan	India	Very commonly *used*	*Saidna, 84, 229; Ziyai, 29a, 59a-b, 180b.*
8.	*Pomegranate*	*India*	*Peel astring-*ent, commonly used	*Saidna*, 229; *Ziyai*, 197b.
9.	Alum	Western		*A.A.* II.p. 317.
10.	Salt	Lahore subah		*Ziyai*, 192a; *A.A.* II.p. 317; Wardle, 28; *Hughes*, I.p. 98
11.	Lime			Wardle, p. 28.
12.	Sulphate of iron			*Infra*, chap. II, Table II.