

Bark-Based Medicinal Significance of Avenue Trees in Amravati City, Maharashtra

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Abstract

Avenue trees are integral to urban landscapes, providing shade, aesthetic value, ecological benefits, and medicinal resources. This study documented 75 tree species belonging to 28 families in Amravati City, Maharashtra, with Fabaceae as the dominant family. Field observations revealed considerable variation in bark, particularly in colour, texture, fissuring, peeling, corkiness, and fibrousness, highlighting its morphological diversity. This distinctive bark characteristics contributed to the documentation of these species, while a literature review highlighted the medicinal significance of their bark. Reported uses included the treatment of fever, gastrointestinal and respiratory disorders, wounds, diabetes, and inflammation, alongside pharmacological activities such as antimicrobial, antioxidant, antidiabetic, and anticancer effects. The integration of tree diversity, bark characteristics, and medicinal significance highlights the multifunctional value of avenue trees and the importance of their conservation and strategic inclusion in urban biodiversity planning.

Keywords: Avenue trees; Bark morphology; Medicinal properties; Amravati City

Introduction

Avenue trees are trees planted along roadsides, streets, highways, and campuses. They are mainly planted for ornamental, shade, aesthetic, and medicinal purposes [4]. In urban areas, avenue trees increase greenery and enhance the beauty of the surroundings while contributing to a healthy environment. They also provide cooling effects, filter air pollutants, and contribute to carbon storage [53].

The importance of avenue trees extends beyond their aesthetic and functional value, as they are directly associated with biodiversity and play a role in maintaining ecological equilibrium [49], [28]. They contribute to ecosystem maintenance and provide natural, social, and physiological services while enhancing air quality [79]. Some species can serve as bioindicators, while their leaves facilitate the interception and accumulation of particulate matter. They also contribute to reducing dust and air pollution, producing oxygen, and supporting fauna in the surrounding landscape [39].

In addition to their ecological significance, the bark of several tree species has been used for medicinal purposes [57]. As bark is an important and persistent character of trees, its characteristics and medicinal properties can provide valuable information for the study of avenue trees. Therefore, consideration of bark characteristics along with the medicinal significance of avenue trees is important. Amravati City, Maharashtra, has a variety of native as well as avenue trees. The Pohara–Malkhed forest, located just outside the city, along with this biodiversity-rich areas such as Maltekdi, gardens, and other green spaces within the city, contributes to the presence of diverse tree species. This highlights the need

to document and evaluate the diversity and multifunctional significance of avenue trees in Amravati City, with particular emphasis on their bark characteristics and medicinal properties. Therefore, the present study was undertaken.

Materials and Methods

Study Area and Field Survey

The study was carried out within Amravati City, Maharashtra, where the study area was systematically surveyed along different roads to document avenue tree species. Regular field visits were conducted across the city to ensure adequate coverage of the study area. The field investigation was conducted from March 2024 to August 2026.

Data Collection and Documentation of Tree Species

A total of 75 tree species belonging to 28 families were recorded and identified using regional floras and expert consultation. For each species, the botanical name, common name, family, flowering and fruiting season, and bark characteristics were documented. Bark colour and other observable bark features were recorded through direct field observations of the trunk. Information on the medicinal properties of the bark was compiled from relevant published literature.

Results and Discussion

The field survey documented 75 avenue tree species across 28 families, reflecting substantial taxonomic diversity. Fabaceae emerged as the most dominant family, followed by Bignoniaceae, Moraceae, and Malvaceae. Several families, including Apocynaceae, Annonaceae, Meliaceae, Myrtaceae, Verbenaceae, Lythraceae, Sapotaceae, and Rubiaceae, were represented by two species each, while others contributed single representatives. This assemblage highlights the coexistence of commonly planted ornamentals and native taxa, underscoring the heterogeneous composition of Amravati's avenue flora.

Observation

Table 1. Taxa Documented in the Study

S.R. NO.	BOTANICAL NAME	COMMON NAME	FAMILY	FLOWERING & FRUITING SEASON	BARK CHARACTER	MEDICINAL USE OF BARK	REFERENCE
1.	<i>Adansonia digitata</i> L.	Gorakh Chinch	Malvaceae	Flowering: April–September; Fruiting: September–February	Smooth texture with a yellowish-grey, greyish-brown colour	Wound healing, Fever.	[64]
2.	<i>Aegle marmelos</i> Linn.	Bel, Maredu	Rutaceae	Flowering: April–July; Fruiting: September–June	Thick, soft, bark	To treat Fever and cough, sperm motility	[44]

3.	<i>Ailanthus excelsa</i> Roxb.	Marukh, Mahrukh, Mahanimb	Simaroubaceae	Flowering: December–March; Fruiting: March–May	Light gray-brown and rough	Astringent, in dysentery, ear ache, skin disease. Gout and rheumatism.	[36]
4.	<i>Albizia lebbbeck</i> (L.) Benth.	Sirish, Siris	Fabaceae	Flowering: April–June; Fruiting: July–October	Thick, surface yellowish-brown, rough, deeply fissured, exfoliating in irregular semi brittle scales; blaze pinkish-yellow	Toothache and diseases of the gum, bronchial asthma and other allergic disorders, piles and diarrhea.	[23], [22]
5.	<i>Alstonia scholaris</i> (L.) R.Br.	Satvin, Saptarni.	Apocynaceae	Flowering: October–December; Fruiting: February–May	Grey-brown, irregularly cracked and shallowly fissured, subverrucose, lenticellate;	Tonic and gastrointestinal sedative. Infusion, milk-leprosy, dyspepsia., after effects of fever, chronic diarrhoea, dysentery and catarrhal fever.	[14]
6.	<i>Annona squamosa</i> L.	Sitaphal, Sharifa, Sitaphal	Annonaceae	Flowering: March–June; Fruiting: July–November	Brown, or dark brown in color, and slightly rough, shallowly fissured	Sedative, ulcer treatment and a nervine tonic, diarrhea, tooth ache. Tonic,	[9]
7.	<i>Azadirachta indica</i> A.Juss.	Neem, Nimbay	Meliaceae	Flowering: March–May; Fruiting: June–August	Greyish-brown, vertically striated	Fever, Pain	[10]
8.	<i>Bauhinia purpurea</i> L.	Rakta Kanchan	Fabaceae	Flowering: September–December; Fruiting: February–May	Pale grey-brown to dark brownish, and fairly smooth to slightly fissured	Anti-arthritic activity, treatment of inflammatory conditions.	[38]
9.	<i>Bauhinia variegata</i> L.	Kanaraj, Kavidara, Kanchan, Rakta-Kanchan	Fabaceae	Flowering: January–April; Fruiting: April–June	Grayish-brown and rough on the outside with slightly cracks and fissures	Liver Disorder, and to treat cancer.	[74]
10.	<i>Bombax ceiba</i> L.	Kat Sawar,	Malvaceae	Flowering: January–March;	Armed with conical prickles, grey	Skin eruptions, boils, acne, pimples.	[50]

				Fruiting: April–June	mottled with white, longitudinal fissures shallow;	Demulcent, styptic, and used to removes phlegmatic. To treat dysentery with blood. Heart disorder as a heart tonic, wound healing.	
11.	<i>Bougainvillea spectabilis</i> Willd.	Booganvel, Kagadi Ful	<i>Nyctaginaceae</i>	Flowering: Almost throughout the year; Fruiting: Rarely observed	Mild corky texture	Low blood sugar	[76]
12.	<i>Butea monosperma</i> (Lam.) Kuntze	Palas, Palash	Fabaceae	Flowering: January– March; Fruiting: April–June	Rough, grey bark	Injury due to axe. Goitre, body swellings. Appetizer, aphrodisiac, laxative, anthelmintic, fractures of the bones, diseases of theanus, dysentery, piles, hydrocele, cures ulcers and tumours. Biliousness, dysmenorrheal, liver disorder, gonorrhea and blood purification. Scorpion sting	[45]
13.	<i>Caesalpinia Pulcherriana</i> (L.) Sw.	Guletura, Sankasur	Fabaceae	Flowering: Almost throughout the year; Fruiting: Summer– rainy season	Greyish- brown to light brown rough texture.	Malarial.	[41]
14.	<i>Callistemon citrinus</i> (Curtis) Skeels	Bottlebrush	Myrtaceae	Flowering: March–July; Fruiting: August– December	Hard rough, brownish-gray to light-gray	Cervical cancer	[70]
15.	<i>Cassia fistula</i> L.	Konna, Golden	Fabaceae	Flowering: April–June; Fruiting:	Pale grey, dark brown, rough,	Skin diseases,	[68]

		Shower, Amaltas.		July– January	and scaly when matures		
16.	<i>Cassia grandis</i> L. f.	Coral Shower	Fabaceae	Flowering: February– May; Fruiting: May– December	Smooth and light grey to pale grey in color,	To treat skin conditions, wound healing	[59]
17.	<i>Casuarina equisetifolia</i> Linn.	Saru, Suru	Casuarinaceae	Flowering: Almost throughout the year; Fruiting: Mainly summer– winter	Bark greyish brown or dark brown	Acne activity, swelling, redness, heat, and tissue irritation	[5] & [72]
18.	<i>Ceiba pentandra</i> (L.) Gaertn.	Salmali, Shameula	Malvaceae	Flowering: January– March; Fruiting: March–May	Smooth and bright green in young trees, turning grayish, colored, pale grey-brown,	Decoction has been used as a urine flow, and to treat headache, as well as type II diabetes.	[17]
19.	<i>Cocos nucifera</i> Linn.	Naral, Shrifal	Arecaceae	Flowering: Throughout the year; Fruiting: Throughout the year	Grayish- brown, ring- like scars left	UTI (urinary tract infection)	[78]
20.	<i>Cordia sebestena</i> Linn.	Lal Lasora, Bohari	Boraginaceae	Flowering: Almost throughout the year; Fruiting: Almost throughout the year	Dark gray to dark brown, rough	Coughs and bronchial ailments.	[82]
21.	<i>Crateva religiosa</i> G. Forst.	Varun	Capparaceae	Flowering: March– May; Fruiting: May– August	Grey, smooth, and longitudinally wrinkled,	Against human ovarian cancer cells	[43]
22.	<i>Dalbergia sissoo</i> Roxb.	Shisam	Fabaceae	Flowering: March– May; Fruiting: October– December	Light brown to dark grey bark, rough bark and mainly longitudinal furrows,	Treatment in controlling anal disorders, dysentery, dyspepsia, leukoderma, and skin ailments.	[51]

						Sciatica, hemiplegia	
23.	<i>Dalgergia paniculata</i> Roxb.	Shisavi, Dhondus	Fabaceae	Flowering: February–April; Fruiting: April–June	Smooth and greenish-white or yellowish-grey	Antioxidant activity,	[11]
24.	<i>Delonix regia</i> (Boj. Ex hook.) Rat.	Gulmohar	Caesalpiniaceae	Flowering: April–June; Fruiting: July–February	Grey to grayish-brown, generally smooth to slightly rough	Antiulcer,	[67]
25.	<i>Erythrina Suberosa</i> Roxb.	Pangara	Fabaceae	Flowering: February–April; Fruiting: April–June	Bark grey, corky, deeply cracked; branchlets tomentose, armed.	Diarrhoea, antitumor activities, liver disorders cytotoxic and activities.	[3]
26.	<i>Eucalyptus globulus</i> Labill.	Nilgiri, Blue Gum Tree	Myrtaceae	Flowering: Winter–spring; Fruiting: Spring–summer	Bark smooth, peeling off in long stripes	Anti-inflammatory, antimicrobial, antibacterial, and antioxidant properties	[18]
27.	<i>Ficus bengamina</i> L.	Nandaruk	Moraceae	April–July	Smooth and colored light gray to gray-white	A palliative of pain, inflammation, fever, diarrheal. Rheumatism	[65]
28.	<i>Ficus benghalensis</i> Linn.	Wad	Moraceae	March–November	Bark grey, smooth, young softly white puberulous	Antidiabetic activity, anti-inflammatory Activity	[58]
29.	<i>Ficus elastica</i> Roxb. ex Hornem.		Moraceae	February–April	Greyish or reddish-brown with a smooth or slightly roughened	Astringent and employed as styptics for injuries	[25]
30.	<i>Ficus racemosa</i> Linn.	Umbar	Moraceae	Flowering: January–April; Fruiting: March–July	Rusty brown with a fairly smooth and soft surface	Leprosy, astringent mouth wash in spongy gum condition, dysentery, menorrhea, hemoptysis, and diabetes wash for wounds, abortions, uropathy. Asthma	[2]

						and piles, burns, swelling, leucorrhea (diarrhoea).	
31.	<i>Ficus religiosa</i> L.	Pipal, Pimpal	Moraceae	Flowering: November–February Fruiting: April–May	Bark grey, smooth	Fishula, To treat Diabetic, asthma,	[31]
32.	<i>Gliricidia sepium</i> (Jacq.) Kunth	Giripushpa, Undirmari	Fabaceae	Flowering: February–April; Fruiting: April–June	Greyish-brown, and much fissured	Scabies and dermatitis and an antipruritic on the skin, used to treat bacterial and protozoal infections.	[52]
33.	<i>Gmnelina arborea</i> Roxb.	Shivan	Verbenaceae	Flowering: February–April; Fruiting: May–July	Bark light grey colored exfoliating in light-colored patches when old, blaze thick, a chlorophyll layer just under the outer bark, pale yellow white inside	Stomachic, galactagogue laxative and; improves appetite, useful in hallucinations, piles, abdominal pains, burning sensations, fevers, ‘tridosha’ and urinary discharge	[48]
34.	<i>Hardwickia binata</i> Roxb.	Anjan	Fabaceae	Flowering: July–September; Fruiting: November–January	Longitudinal fissures in the thick, tough, dark grey to black bark.	Wounds, ulcers, cuts, burns, boils, abscesses, and chronic skin infections, astringent, and wound-healing properties, orally in the treatment of inflammatory illnesses, haemorrhoids, dysentery, fever, gastrointestinal issues, bleeding problems, and decoctions.	[61]
35.	<i>Holoptelea integrifolia</i>	Ainasadada, Vavali	Ulmaceae	Flowering: January–March; Fruiting: March–May	Whitish-grey, smooth; blaze yellowish-grey, streaked	To treat several skin diseases, such as leprosy, leukoderma, and chronic wounds,	[81]

	(Roxb.) Planch.				with light brown.	wound healing and anti-inflammatory activity.	
36.	<i>Kigelia pinnata</i> (Jacq.) DC.	Waghul Phul	Bignoniaceae	Flowering: March– June; Fruiting: August– February	Greyish- brown, smooth when younger, rough	Dysentery and (stds) syphilis, to treat sores or fungal infections on the skin. Snakebite, soften the skin, ulcers, pneumonia and toothache	[24]
37.	<i>Lagerstroemia reginae</i> Roxb.	Tamhan	Lythraceae	Flowering: April–July; Fruiting: August– December	Pale brown, yellowish- brown, or grey	Treatment for diarrhea	[29]
38.	<i>Lagerstroemia speciosa</i> L.	Jarul, Motha Bondara, Tamhan	Lythraceae	Flowering: April–July; Fruiting: August– January	Pale brown, yellowish- brown, or grey	Stimulant, febrifuge, and for relief of abdominal pains.	[12]
39.	<i>Leucaena leucocephala</i> (Lam.) de Wit	Subabul	Fabaceae	Flowering: Almost throughout the year; Fruiting: Almost throughout the year	Darker grey- brown, rougher, and fissured with shallow, brown vertical stripes	To treat cancer and diabetes and liver disorders.	[37] , [7]
40.	<i>Madhuca longifolia</i> (L.) J.F. Macbr.	Moha	Sapotaceae	Flowering: February– April; Fruiting: May–July	Grey bark, vertically cracked and wrinkled	Rheumatism, chronic bronchitis, decoction for rheumatism, Bleeding and spongy gums. Tonsillitis	[83]
41.	<i>Mangifera indica</i> L.	Amba, Ambo	Anacardiaceae	Flowering: December– March; Fruiting: April–July	Dark grey, rough with vertical fissures;	Diarrhoea, gastric disorders, asthma, mouth sores, liver/hepatic disorders, diabetes, rheumatism, leucorrhoea, bleeding hemorrhoids, lung hemorrhage, nerve disorders, syphilis, cough, jaundice,	[85]

						hypotension, anemia, itching/scabies, tooth pain, cancer, lupus, wounds, dysmenorrhoea and liver obstruction. Gingivitis, dysentery, infertility, prostatitis, prostatic hyperplasia, arthralgias, menorrhagia, melancholia, nervous debility, chest pain, infected wounds, skin diseases and dental caries	
42.	<i>Melia azedarach</i> L.	Bakan-Nimb	Meliaceae	Flowering: March–May; Fruiting: September–February	Grey-brown, smooth and lenticellate when young, and becomes shallowly fissured,	Paroxysmal fever to alleviate thirst, vomiting, nausea, loss of appetite, and general debility. Skin diseases antimalarial, antioxidant, antibacterial activities	[32] ; [63]
43.	<i>Millingtonia hortensis</i> Linn.	Kaval Nimb	Bignoniaceae	Flowering: September–December; Fruiting: December–March	Dark brown colored	Throat ailments, coughs, and hangovers, anthelmintic activity, antibacterial and anti-inflammatory activities.	[15]
44.	<i>Mimusops elengi</i> Linn.	Bakuli	Sapotaceae	Flowering: March–June; Fruiting: May–September	Brownish-black, rough, scaly, and cracked or fissured longitudinally	Gastric ulcer.	[73]
45.	<i>Mitragyna parvifolia</i>	Kadamb, Kalam	Rubiaceae	Flowering: April–July; Fruiting:	Grey-black, smooth exfoliations thin, irregular,	Antipyretic remedy and rheumatic pain pregnancy- and	[80]

	<i>a</i> (Roxb.) Korth			August– November	fibrous; blaze pink, traversed by whitish rays;	childbirth-related indications, abdominal pain, dysentery, and schistosomiasis	
46.	<i>Moringa oleifera</i> Lam.	Shevga	Moringaceae	Flowering: February– April; Fruiting: March– June;	Thick corky bark.	UTI, antibacterial, oxidative stress	[42]
47.	<i>Neltuma juliflora</i> (Sw.) Raf.	Vilayati Babul	Fabaceae	Flowering: February– April; Fruiting: May–July	Bark thick, brown or blackish, shallowly fissured	Antioxidant potential, antibacterial,	[1]
48.	<i>Neolama rckia cadamba</i> (Roxb.) Bossner	Kadamb, Kalam	Rubiaceae	Flowering: June– August; Fruiting: September– November	Bark is deep grey with longitudinal fissures and thin scales that exfoliate	Fever, eye infection, Dyspepsia	[77]
49.	<i>Parkia biglandul osa</i> Wight & Arn.	Chendu Phul	Fabaceae	Flowering: March– June; Fruiting: July– December	Grey-brown and smooth	Diseases caused by different germs, Antimicrobial.	[69]
50.	<i>Peltopho rum pterocar pum</i> (Dc) Backer Ex K. Heyne.	Peela Gulmohar	Fabaceae	Flowering: April– September; Fruiting: October– February	Brownish grey color in outer surface, rough, longitudinal cracks and fissures,	Dysentery, tooth powder, eye trouble, muscular pain and sores	[26]
51.	<i>Petrospe rmum acerifoli um</i> (L) Willd.	Muchakund	Malvaceae	Flowering: March– May; Fruiting: June– December	Grey-brown or blackish color and a rough,	To treat ulcer, inflammation, and wound healing properties	[46]
52.	<i>Phoenix sylvestris</i> (L.) Roxb.	Kharik, Kharjur, Kharjuri, Shinda, Shindi	Arecaceae	Flowering: February– April; Fruiting: May– August	Grey rough, typically covered with persistent leaf bases and scars left.	-----	----- ----- -----
53.	<i>Phyllant hus emblica</i> (L.)	Awala	Phyllanthaceae	Flowering: March– May; Fruiting:	Greyish- brown, rough in texture, and characteristica	Gonorrhea. Anti- diarrheic effects and leucorrhoea	[60]

				October–February	lly flakes or peels off in irregular or thin scales	(vaginal infection).	
54.	<i>Pithecell obium dulce</i> (Roxb.) Benth.	Vilayatichinch	Fabaceae	Flowering: December–March; Fruiting: April–June	Greyish and smooth, at maturity dark brown and fissured	To treat gum ailments, toothache and bleeding. Chronic diarrhea, dysentery, constipation and tuberculosis.	[35]
55.	<i>Plumeria rubra</i> Linn.	Chafa	Apocynaceae	Flowering: March–October; Fruiting: May–December	Grey to light brown, rough	To treat amoebic dysentery, Dropsy, jaundice, scabies, gonorrhea, venereal affections and wounds. Emmenagogue, febrifuge, purgative and stimulant, To treat disperse tumors	[75]
56.	<i>Polyalthai Longifolia</i> CV.		Annonaceae	Flowering: March–May; Fruiting: June–October	Dark grayish-brown, shallow fissures or longitudinal cracks.	Fever, skin disease, diabetes, hypertension, helminthiasis, and vitiated conditions of vata and pitta.	[33]
57.	<i>Pongamia pinnata</i> (L.) Pierre	Karanji, Karanj	Fabaceae	Flowering: March–May; Fruiting: June–December	Surface grey, smooth, speckled with brown; blaze-yellow; branchlets lenticellate.	Bleeding piles, beriberi diabetes and as an antimicrobial	[20]
58.	<i>Putranjiva roxburghii</i> Wall.	Jivanputra, Patravanti	Putranjivaceae	Flowering: February–April; Fruiting: May–August	Dark grey, whitish when young with horizontal lenticels	Dental caries, anti-hyperglycaemic activity	[47], [13]
59.	<i>Roystonea regia</i> (H.B.K.) O.F.Cook	Royal Palm	Arecaceae	Flowering: Spring–summer; Fruiting: Summer–winter	Smooth, light gray to grayish-white, closely-spaced horizontal leaf scars.	-----	-----

60.	<i>Samanea saman</i> (Jacq.) Merr.	Vilayati Siris,	Fabaceae	Flowering: March–June; Fruiting: June–February	Rough, wrinkled, and dark grey to grayish-brown,	Constipation. Diarrhoea, its organ protection properties, anti-inflammatory activity,	[84]
61.	<i>Sapindus emarginatus</i> Vahl.		Mimosaceae	Flowering: March–May; Fruiting: October–February	Greyish-brown to reddish-brown, rough, and scaly bark, exfoliates in irregular patches	Liver diseases	[27]
62.	<i>Saraca asoca</i> (Roxb.) W.J.de Wilde	Jasundi, Sita Ashoka, Sorrow-Less Tree.	Fabaceae	Flowering: February–May; Fruiting: July–September	Dark brown, grey to black, rough	Treatment of menorrhagia, dysmenorrhea, leucorrhoea, uterine hemorrhage and other female health issues	[8]
63.	<i>Senna siamea</i> (Lam.) H.S.Irwin & Barneby	Kassod,	Fabaceae	July–December	Grey and smooth, and later with longitudinal fissures.	Body bath against malaria and liver disorders, against diabetes.	[30]
64.	<i>Spathodea campanulata</i> P. Beauv.	Rugtoora	Bignoniaceae	December–July	Warty light gray bark.	To treat malaria, low sugar activity, heal wound. Against bacterial activity	[55]
65.	<i>Syzygium cumini</i> (L.) Skeels	Jambool, Jamun, Jambufal	Myrtaceae	Flowering: March–April; Fruiting: May–July	Smooth, flakes in patches Grey to silvery Flaky patches marked by hollows where old bark has fallen off, pitted also.	Digestive and To cure sore throat, bronchitis, asthma, thirst, biliousness, dysentery, blood impurities and ulcer	[62]
66.	<i>Tabebuia aurea</i> (Manso) Benth. & Hook. f. ex S. Moore	Ghanti Ful	Bignoniaceae	Flowering: February–April; Fruiting: April–June	Silvery foliage and deeply furrowed, silvery bark	Antimicrobial activity,	[6]

67.	<i>Tabebuia rosea</i> (Bertol.) DC.	Vasanta Rani	Bignoniaceae	Flowering: February–April; Fruiting: April–June	Grayish-brown to dark gray, rough, and vertically fissured	Neutralizing effect against venom of <i>Bothrops atrox</i>	[54]
68.	<i>Tamarindus indica</i> L.	Chinch,	Caesalpiniaceae	Flowering: March–June; Fruiting: December–April	Rough Dark grey to black Fissures and horizontal cracks Vertical Shallow	For stomach disorders, general body pain, jaundice, and yellow fever, as well as for use as a blood tonic and skin cleanser	[16]
69.	<i>Tecoma stans</i> (L.) Juss. ex Kunth,	Ghanti Ful, Trumpet Tress, Ramat Emas, Yellow Trumpet Flowers, Yellow Elder.	Bignoniaceae	Flowering: Almost throughout the year; Fruiting: Almost throughout the year	Smooth, light-colored stems at the base, which eventually turn into light-gray, grooved bark.	Smooth muscle relaxant, mild cardiostimulant, and choleretic properties,	[71]
70.	<i>Tectona grandis</i> Linn.	Sagwan , Sag	Verbenaceae	Flowering: June–September; Fruiting: November–January	Light brown or grey, distinctly fibrous with shallow, longitudinal fissures	Treatment of bronchitis, analgesic and antiinflammatory activities, Antifungal and antibacterial activity, used as an immuno- adjuvant	[34]
71.	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn	Arjuna,	Combretaceae	Flowering: April–July; Fruiting: August–November	Bark is grey and smooth, Peeling in thin sheets, flaking off in patches	Cardiotonic used in heart failure, ischemia, cardiomyopathy, atherosclerosis, myocardium necrosis, blood diseases, anemia, venereal, and viral disease. Treatment of fractures, ulcers, and hepatic and showed hypocholesterolemic, used in fertility disorders, and anti-hiv activities.	[40], [19]
72.	<i>Terminalia bellarica</i>	Behada	Combretaceae	February–June	Bluish grey with many fine	Bark is a mild diuretic and is	[66]

	(Gaertn.) Roxb.				vertical cracks.	useful in anaemia and leucoderma.	
73.	<i>Terminalia catappa</i> L.	Jangli Badam	Combretaceae	Flowering: March– June; Fruiting: July–October	Greyish to light brown or grey-brown, smooth on young trees, and becomes rough,	Gastrointestinal disorders such as dysentery, diarrhea, colitis, dyspepsia and intestinal parasites. Skin diseases, hepatitis and other liver problems. Heart stimulator, anti- diarrhoeal, bactericidal, anti- parasitic and anti- stress,	[86]
74.	<i>Thevetia nerifolia</i>	Bitti, Kanher	Apocynaceae	May– December	----- --	-----	----- ----- ---
75.	<i>Ziziphus mauritiana</i> Lamk.	Badari, Bher, Bor, Saubari	Rhamnaceae	Flowering: August– November; Fruiting: November– March	Bark dark grey or nearly black, with deep vertical cracks, reddish and fibrous inside;	Diarrhoea and dysentery. Astringent in gingivitis, to cure boils, applied to sores	[21]

Phenological observations revealed both seasonal and near-continuous flowering/fruiting species, such as *Bougainvillea spectabilis*, *Caesalpinia pulcherrima*, *Senna siamea*, *Peltophorum pterocarpum*, and *Tecoma stans*, enhancing year-round urban greenery. Bark traits exhibited marked variation in colour (light grey to nearly black), texture, fissuring, peeling, exfoliation, corkiness, fibrousness, and lenticel development. Distinctive examples included the fibrous bark of *Tectona grandis*, corky bark of *Aegle marmelos*, peeling bark of *Terminalia arjuna*, and fissured bark of *Azadirachta indica*. Such readily observable traits provide valuable diagnostic characters for species recognition in the absence of reproductive structures.

The medicinal literature further emphasized the multifunctional significance of avenue trees. Bark extracts were reported for diverse therapeutic uses fever, gastrointestinal and respiratory disorders, skin ailments, wounds, inflammation, diabetes, rheumatism, and dental conditions alongside pharmacological activities such as antimicrobial, antioxidant, anti-inflammatory, antipyretic, antidiabetic, antiulcer, wound-healing, hepatoprotective, and anticancer effects. Notably, *Mangifera indica* and *Terminalia arjuna* exhibited broad pharmacological relevance, while *Azadirachta indica*, *Ficus racemosa*, *Hardwickia binata*, *Holoptelea integrifolia*, and *Peltophorum acerifolium* also demonstrated multiple applications.

Overall, the integration of taxonomic diversity, bark morphology, and medicinal significance underscores the ecological and multifunctional importance of Amravati's avenue trees. Documenting bark

traits alongside medicinal knowledge enriches urban botanical records and highlights bark as a critical morphological character in tree identification and ecological assessment.

Conclusion

The findings highlight the multifunctional roles of avenue trees through their bark morphology and medicinal significance. Variation in bark colour, texture, fissuring, peeling, corkiness, and fibrousness provides reliable traits for species identification and enriches urban botanical documentation. At the same time, the bark of many species is valued in traditional medicine, with reported uses ranging from fever and gastrointestinal disorders to diabetes, inflammation, and wound healing, supported by diverse pharmacological activities. Collectively, these results emphasize bark as both a key morphological character and a medicinal resource, underscoring the importance of conserving and integrating diverse tree species into urban landscapes for ecological resilience, cultural heritage, and sustainable development.

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