Research Article

Timber yielding plants of district Haridwar and adjacent Siwalik hills

Shyam Singh

Deptt of Botany, M.S. College, Saharanpur, Uttar Pradesh, India.

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Abstract

Timber yielding plant of district Haridwar are valuable and have great importance in forestry of Uttarakhand state, Raja Ji National Park of Shivalik Hills have a great variety in the flora. About 93 families of the tree plants are found in the part and pathri forest of district Haridwar in which more Timber belongs to dicotyledons and some belong to group monocotyledons. Timber commonly used in plywood, Railway sleepers, building construction material and in furnitures. Total 100 plant species belonging to 93 families have been identified and specimen twig of some trees collected and preserved in the Herbarium of M.S. College, Saharanpur.

Keywords: Timber, Haridwar, National Park, Pathri forest, Forest.

Introduction

The control and command of early man over fire initiated the beginning of social life and gave birth to a whole series of related technologies that would otherwise have been inconceivable. The settled mode of life called for a more permanent dwelling place which laid the foundation of civilization. With the advancement of civilization and modern tools and techniques the innovative ways of use of natural products including woods appeared. Now, however, we are living in the age of steel, concrete, plastics and electronics, wood still finds prestigious position as the world's most important raw material being used among nearly 5,000 different manufactured products obtained from the forests. The products and services that the woods render to modern life especially in housing, transportation and the manufacture of variety of products are beyond obligation. The paper used for printing and writing is largely manufactured from wood pulp.

The Haridwar is a holy city, it is situated at 39°-58' N and 78°-10' E on the River Ganga at the foot hills of shivaliks that constitute the outer Himalaya. The city vary close to the gorge through which the Ganga river passes, the plains on the opposite "shores" rises the hills of Neel Parvat whose summit is crowned by Chandi Devi Temple. Haridwar, Roorkee and Laksar with 7 blocks spreading over 2,360 Square Km. area of which Haridwar proper is extended in an area of 12,302 Square Kilo meter at the altitude of 294.7 meter from the sea level. It is considered as a gate way to four Dhams i.e., Kedarnath, Badrinath, Gomukh and Jamunotri. Being a holy city and a pilgrimage centre, various religious ceremonies and rituals are performed throughout the year in Haridwar.

The economy of Haridwar (Uttarakhand) more or less is based on forest product in the form of Timbers and forest-based industries almost one third of the area is under forest cover. "The author¹ started collecting the plant from different part of district from July 2002 onwards like Raja Ji National Park & Pathri forest which is a mangrove of central Government and from other parts also Goel & Murty (1984) works on flora, of district Saharanpur likewise some workers were associated with Saharanpur Botanical Garden and collected plants from the district and adjacent areas, (Duthie 1906, Kanjilal 1928, Champion 1936, Rau 1969, Raizada 1976, Chandra & Bennet 1991, Uniyal & Rao 1993) Now Haridwar is a separate district.

Materials and Methods

The plant Twigs collected from the different part of the district and preservation was done with the help of Alcohol and HgCl₂. The preserved plant twig pasted on the herbarium sheets with the help of "Sareesh" and after it Stretching is done the Herbarium Sheets and then preserved in the Harbarium of M. S. College, Saharanpur.

Timber Zones of Haridwar:

Phyto geographically Haridwar divided into two following timber zone (1) Plains and Pathri forest (2). The shivalik hills

Results and Discussion

Timber industries in Haridwar to utilize its forest resources many Timber industries are established, thus about 20 (Twenty) saw mills are located in Haridwar. The saw mills are present in Jawalapur Roorkee & Manglore. Manglore is a big centre for

*Corresponding Author:

Dr. Shyam Singh,

Assistant Professor, Department Of Botany,
M.G.P.G. College, Gorakhpur (U.P.), India.

E-mail: drshyamsingh62@gmail.com

the timber-based product. Two ply wood factories are present in Bhagwanpur, the total annual production capacity of the plywood factory is about

21,265 m³ per annum. Two paper and Board mills are also established in Bahadradab and Jagjitpur.

Table 1.

S.No.	Zone	Approx. Altitude (m)	Climax
(1)	(2)	(3)	(4)
1.	Tropical forest	294.3(M)	<i>Acacia, Adina, Albizia, Anogeissus, Anthocephalus, Bridelia, Buchanania, Careya, Dalbergia, Dillenia, Diospyros, Engelhardtia, Hototepetelia, Hymenodictyon, Lagerstroemia, Mangifera, Michelia, Mesua, Oroxylon, Premocarpus, Schima, Scheuchera, Shorea, Terminalia, Trevisia</i>
2.	Subtropical forest	274.7(M)	<i>Alnus, Bischofia, Bombax, Boswellia, Castanopsis, Cinnamomum, Dalbergia, Erythrina, Fraxinus, Juglans, Lenea, Myrsine, Ougenis, Pinus, Quercus, Toona etc.</i>

Monocotyledons				
S.No.	Plant	Family	Zone	Use
1	<i>Bambusa arundinacea</i> willd.	Poaceae	Tropical	Roof making basket, furniture other uses
2	<i>Dendrocalamus strictus</i> (Roxb) Nees.	Poaceae	Tropical	Roof making basket, furniture other uses
3	<i>Dendrocalamus hamiltonii</i> – Nees & Arm	Poaceae	Tropical	Roof making basket, furniture and other uses
Gymnosperms				
1	<i>Abies Pindrow</i> -Boiss	Pinaceae	Tropical	Used for construction, House making and furniture.
2	<i>Cedrus deodara</i> D. Don	Pinaceae	Tropical	Construction Furniture and general works
3	<i>Cupressus strobilosa</i> , D. Don	Cupressaceae	Tropical	General Construction pencil and pen holders, Cabinet furniture work, fence post poles and railway Carriage
4	<i>Juniperus squamata</i> Hom	Pinaceae	Tropical	Used in Fuel, shelter, house making
5	<i>Pinus roxburghii</i> Sargent	Pinaceae	Subtropical	Electric Poles, Picture, Frames, Railway Carriage & Wagons
6	<i>Pinus longifolia</i> -Roxb	Pinaceae	Subtropical	Electric Poles, Picture, Frames, Railway Carriage & Wagons
7	<i>Pinus wallichiana</i> Jacks	Pinaceae	Subtropical	Electric Poles, Picture, Frames, Railway Carriage & Wagons
8	<i>Picea smithiana</i> -Boiss	Pinaceae	Subtropica	Picture frames, construction and Agricultural works
9	<i>Taxus baccata</i> Linn (cultivated)	Taxaceae	Subtropica	Lightwood work Bowmaking, wood carrying
Dicotyledons				
1	<i>Acacia nilotica</i> (L.) willd ex. Del	Mimaceae	Tropical	Agricultural Implement Boat, Ship, Cart and Cartage Rifle, Parts Bobbins.
2	<i>Acacia catechu</i> –willd	Mimaceae	Tropical	Agricultural Implement Boat, Ship, Cart and Cartage Rifle, Parts Bobbins.
3	<i>Acacia leucophloea</i> willd.	Mimaceae	Tropical	Agricultural Implement Boat, Ship, Cart and Cartage Rifle, Parts Bobbins
4	<i>Albizia lebbek</i> (L.) Benth	Mimaceae	Tropical	Furniture, Cabinet, Boxes and cots
5	<i>Albizia procera</i> Benth	Mimaceae	Tropical	Furniture, Cabinet, Boxes and cots
6	<i>Albizia odoratissima</i> Benth	Mimaceae	Tropical	Furniture, Cabinet, Boxes and cots
7	<i>Anogeissus latifolia</i> (Roxb) Bedd. var tomentosa	Combretaceae	Tropical	Agricultural implements, cart & carriage, Ski runners
8	<i>Anthocephalus indicus</i> A Rich	Rubiaceae	Tropical	Common Packing cases and boxes
9	<i>Adina cordifolia</i> (Roxb) Hook	Rubiaceae	Tropical	Musical instruments, sitar, tanpura, violins, pen holders, picture frames, combs
10	<i>Azadirachta indica</i> , A. Juss	Meliaceae	Tropical	Railway Carriage, Agricultural implements Boxes, Furniture
11	<i>Aegle marmelos</i> -Corr	Rutaceae	SubTropical	Agricultural implements and construction work
12	<i>Betula utilis</i> Don (Syn B. <i>bhojpattra</i> Wall)	Betulaceae	Subtropical	Used for writing Pulp wood and paper Making
13	<i>Betula alnoides</i> Ham	Betulaceae	Subtropical	Fuel and Boxes, Pulp wood and paper making
14	<i>Boswellia serrata</i> Roxb	Burseraceae	Subtropical	Agricultural use, construction and general work.
15	<i>Bischofia javanica</i>	BlumePhyllanthaceae	Subtropical	Bridge making, Agriculture use, construction.
16	<i>Bridelia retusa</i> Spreng	Phyllanthaceae	Subtropical	Bridge construction and other Agricultural uses.
17	<i>Buchanania lanzan</i> Spreng	Anacardiaceae	Tropical	Boat building and domestic flooring
18	<i>Bauhinia malabarica</i> Roxb.	Fabaceae	Tropical	Used in construction work Agricultural uses.

19	<i>Bombax cieba</i> Linn	Bombacaceae	Subtropical	Cooprage in barrel making Plywood and match sticks
20	<i>Butea monosperma</i> (Link Taub)	Fabaceae	Subtropical	Well curbs and water scoops, spoons, Landles.
21	<i>Bauhinia racemosa</i> Linn	Fabaceae	Subtropical	Used in construction and Agriculture work.
22	<i>Castanopsis indica</i> A.DC	Fagaceae	Tropical	For charcoal making and other uses
23	<i>Castanopsis tribuloides</i> A.DC	Fagaceae	Subtropical	For charcoal making and other uses
24	<i>Cinnamomum camphora</i> T.nees & Eberm	Lauraceae	Subtropical	Wood used camphor as Timber General works
25	<i>Cassia fistula</i> Linn.	Fabaceae	Subtropical	Construction, medicinal and Agricultural uses.
26	<i>Callicarpa arborea</i> Roxb	Lamiaceae	Tropical	Agricultural use and mosquito Replait
27	<i>Careya arborea</i> Roxb	Lecythidiaceae	Tropical	Curved material dyes, Tanins, Timbers Poles
28	<i>Caseariotomentosa</i> - Roxb	Salicaceae	Tropical	Furniture cabinet work, boat building.
29	<i>Cordia dichotoma</i> , Forst. F	Cordiaceae	Tropical	Agriculture uses and for fuel
30	<i>Dalbergia lanceolata</i> Linn.	Fabiaceae	Subtropical	Boat & Ship Axe and tool handles, construction work, furniture musical instrument
31	<i>Dalbergia sissoo</i> Roxb	Fabaceae	Subtropical	Boat & Ship Axe and tool handles, construction work, furniture musical instrument.
32	<i>Dillenia indica</i> Roxb	Dilleniaceae	Tropical	Agricultural use, Poles rafters, Shafts, Picture frames.
33	<i>Diospyros dubiya</i> Roxb	Ebenaceae	Tropical	Sports goods, Billiard cue shafts, picture frames.
34	<i>Delonix regia</i> , Raf.	Caesalpinaceae	Tropical	Agricultural use, handles and Carpentry tools.
35	<i>Diploknema butyracea</i> - Roxb	Sapotaceae	Tropical	Furniture and fuel, Agricultural uses.
36	<i>Diospyros tomentosa</i> Roxb	Ebenaceae	Tropical	Spots good, Billiard cue Shafts picture frames.
37	<i>Engelhardtia spicata</i> Blume	Juglandaceae	Tropical	Cart wheels and agriculture use.
38	<i>Erythrina resupinata</i> Roxb.	Fabaceae	Tropical	Building material, Fodders Toys making other uses.
39	<i>Eucalyptus, citriodora</i> Linn	Myrtaceae	Tropical	Rail road ties poles, Hook handles, doors and agriculture use, plywood papers making boxes
40	<i>Eucalyptus - globulus</i> - Labill	Myrtaceae	Tropical	Rail road ties poles, handles, doors and agriculture use, plywood papers, making boxes.
41	<i>Eucalyptus robusta</i> - Smith	Myrtaceae	Tropical	Rail road ties poles, handles, doors and agriculture use, plywood papers, boxes.
42	<i>Embelica officinalis</i>	Euphorbiaceae	Subtropical	Agricultural implements, poles, furnitures.
43	<i>Ehretia leavis</i> -Roxb	Boranaceae	Tropical	Fuel and charcoal and other Agricultural uses.
44	<i>Erithina suberosa</i> Roxb	Fabaceae	Tropical	Turnery, Carvings and sculpture arts Toys
45	<i>Flacourtia indica</i> (Burm f) Merr	Salicaceae	Tropical	Fire wood, charcoal, handles of plow and agriculture uses.
46	<i>Feronia limonia</i> (Linn.) Swingle	Rutaceae	Tropical	Agricultural uses and poles, construction
47	<i>Ficus rumphii</i> Blume	Moraceae	Tropical	Furnitures and agricultural uses
48	<i>Ficus recemosa</i> Linn	Moraceae	Tropical	Furnitures and agricultural uses
49	<i>Ficus religiosa</i> Linn	Moraceae	Tropical	Furnitures and agricultural uses
50	<i>Garuga pinnata</i> Roxb	Burseraceae	Tropical	Crate, Carings, Toys wood turning
51	<i>Gravia tilifolia</i> vahl	Tillaceae	Tropical	Cart and carriage barrel making, cricket bales and stumps Golf clups
52	<i>Gemlina arborea</i> . Roxb	Lamiaceae	Tropical	Paper and plup making, hands Tennis rackets, frames, Carriages
53	<i>Grevillea, roubusta</i> A. Cunn. Ex R. Br	Proteaceae	Tropical	Furniture, Cabinet and Agriculture uses.
54	<i>Holarrhena antidiysenterica</i> Wall	Apocynaceae	Tropical	Paper and Pulp and fire wood
55	<i>Hymenodictyon excelsum</i> . Wall	Rubiaceae	Tropical	Boxes, Agricultural uses
56	<i>Haplophragma adenophyllum</i> (wall) dopx.	Apocynaceae	Subtropical	Used for Building material and Agriculture uses.
57	<i>Holoptelea integrifolia</i> Planch	Ulmaceae	Tropical	Used for Medicine and fuel general work.
58	<i>Kydia calycina</i> , Roxb	Malvaceae	Tropical	House hold articles and agricultural use, Toys, Penciles, Match Box
59	<i>Lannea Coromandelica</i> (Houtt) Merr.	Anacardiaceae	Tropical	Wood carving, Turnery and furniture
60	<i>Lagerstroemia Speciosa</i> (L.) Pers.	Lythraceae	Tropical	Furniture Agriculture uses

61	<i>Lagerstroemia parviflora</i> Roxb.	Lythraceae	Tropical	Furniture Agriculture uses
62	<i>Litsea monopetala</i> Roxb	Lauraceae	Tropical	Furnitures, Planks Tool Handles, house building.
63	<i>Michelia champaca</i> Linn.	Magnoliaceae	Tropical	Furnitures cabinet work carving, Pattern making.
64	<i>Michelia kisopa</i> , Buch. Ham. exDC	Magnoliaceae	Tropical	Boxes, Musical Instruments, Toys, furnitures.
65	<i>Magnolia campbellii</i> Hook. f. Thoms.	Magnoliaceae	Tropical	Cretes, Boxes, light furniture
66	<i>Mallotus philippensis</i> (LamK)Muell.Arg	Euphorbiaceae	Tropical	As Fuel and dye (Kum Kum)
67	<i>Mallotus nepalensis</i> Muell Arg.	Euphorbiaceae	Tropical	Wood Carving, planking, Agriculture use
68	<i>Myrsines emiserata</i> Wall	Primulaceae	Tropical	Used for Bows Sword, planks, Furnitures making.
69	<i>Mitragyna parviflora</i> Korth	Rubiaceae	Tropical	Constructions, furniture making Agriculture implements.
70	<i>Madhuka indica</i> G. Mel	Sapotaceae	Tropical	Used in house hold and Agriculture uses, Plywood, furniture, musical instrument, Agricultural uses.
71	<i>Mangifera indica</i> Linn	Anacardiaceae	Tropical	As fuel, and Boat & Ship formation.
72	<i>Millettia avelutina</i> Hook	Annonaceae	Subtropical	Musical instrument, fibrous furniture, Agricultural uses.
73	<i>Morus alba</i> Linn	Moraceae	Tropical	As fuel and Tennis, General work
74	<i>Oroxylum indicum</i> Vent	Bignoniaceae	Sub tropical	For wheel making and furniture
75	<i>Ougeinia oojeinensis</i> Hoast	Fabaceae	Tropical	Agriculture use
76	<i>Pterocarpus marsupium</i> (Roxb.)	Fabaceae	Tropical	Used for high quality furniture and wooden tumbler
77	<i>Putranjiva roxburghii</i> wall	Putranjivaceae	Tropical	Used for house building, Agriculture implements handles tools
78	<i>Psidium guajava</i> Linn	Myrtaceae	Tropical	Used to make poles Fence posts and tools handicrafts
79	<i>Prunus persica stokes</i>	Rosaceae	Sub tropical	Used in Bow making, picture frame, and construction work.
80	<i>Populus alba</i> L	Saliceae	Sub Tropical	Shelter belts, Plywood, Boards and Fuel.
81	<i>Quercus glauca</i> Thumb	Fagaceae	Sub Tropical	Flooring and furniture, fuel and Agricultural uses.
82	<i>Quercus lamellosa</i> - Smith	Fagaceae	Sub Tropical	Coprage, Barel making, Agricultural use and fuel
83	<i>Quercus pachyphylla</i> – Karz	Fagaceae	Sub Tropical	Coprage, Barel making, Agricultural use and fuel.
84	<i>Quercus lineata</i> Bl	Fagaceae	Sub Tropical	Coprage, Barel making, Agricultural use and fuel
85	<i>Rhododendron arboreum</i> – Sm.	Ericaceae	Sub Tropical	Household works, fuel and charcoal making
86	<i>Scheucheraoleosa</i> (Lour) Oken	Spindaceae	Tropical	Poles, Agricultural use, firewood
87	<i>Shorea robusta</i> Roth.	Dipterocarpaceae	Tropical	Cart and Carriage, Boat and ship building, sleepers, beams and construction work furnitures.
88	<i>Schima wallichii</i> (D.C.) Korth	Theaceae	Tropical	Beams, Board for house construction, Fence posts
89	<i>Syzygium cumini</i> (L.)	Myrtaceae	Tropical	Cart and Carriage furniture, skeels. Construction work and Agricultural
90	<i>Sterculia pallans</i> Wall	Sterculiaceae	Tropical	Construction work and uses fuel wood.
91	<i>Sterculia villosa</i> - Roxb	Sterculiaceae	Tropical	Box making, Agricultural use.
92	<i>Stereospermum suaveolens</i> D.C	Bignoniaceae	Tropical	Agricultural use, fuel wood
93	<i>Sesbania grandiflora</i> (Linn) Pers	Fabaceae	Tropical	Used for Fancy Furniture, construction fuel wood
94	<i>Tamarindus indica</i> Linn	Fabaceae	Subtropical	Furniture making wheels, mallets Agriculture and Charcoal.
95	<i>Terminalia arjuna</i> W.& A.	Combretaceae	Subtropical	Agricultural use, Boat making and Furnitures.
96	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Tropical	Furniture, Boxes, House construction.
97	<i>Terminalia myriocarpa</i> G.	Combretaceae	Tropical	Top quality furniture, Ply wood, Constructions
98	<i>Terminalia chebula</i> – Retz.	Combretaceae	Tropical	Used for furniture construction work, wood carving.
99	<i>Toona ciliata</i> Roem	Maliaceae	Tropical	Furniture, Musical instruments and Agricultural uses
100	<i>Wrightia tinctoria</i> R.Br.	Apocynaceae	Tropical	Used in wood carving, Turnery and Agriculture uses.

The Government raised protection for twenty important Timbers species viz. *Abies pindrow*, Royle. *Adina cordifolia*, Hook f., ex Brandis, *Anogeissus latifolia*, (Roxb) Bedd. *Albizia lebbbeck* (L) Benth. *Alnus nepalensis*, Don; *Bischofia Javanica*, Blume, *Bombex ceiba*, Linn, *Careya arborea*, Roxb., *Toona Ciliata*, Roem; *Cedrus deodara*, G. Don. f; *Dalbergia sissoo*, Roxb. *Dillenia, pantagyana*, Roxb, *Machelia champaca*, Linn; *Pinus roxburghii sparg*, *Shorea, robusta*, Gaerten. F. and *Terminalia arjuna* W & A.

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