

Utilization of different wood species – Analysis of old literature



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The usage of wood has always been linked to the material properties. For different applications there are different requirements. This seems to be especially interesting for rarely used wood species.

Wood properties and utilizations of different wood species in old literature were reviewed, considering the period between about 1800 and 1938. Over 70 wood and shrub species, found in 25 books, were listed and characterized.

The question is whether the connection between the properties and utilizations is obvious and therefore described in literature. Of course another important influence when looking at wood use is the availability of certain types of wood.

Approach

For each book a detailed, so called, literature assortment in tabular form has been made. These assortments contain every mentioned wood species together with each linguistic description of property and utilization. Later the literature analysis is generated out of the literature assortments. In the literature analysis the information is reduced and condensed, an overview is generated to represent properties and utilizations clearly. **In fact the analysis is an illustration of frequency of mentions.** 7 classes of properties and 8 classes of utilizations are shown in the analysis charts.

Utilizations

Wood species	Construction Timber	Hydraulic, Outdoor Engineering	Carpenter, Veneer, Furniture	Tools, Devices, Wainwright	Turner, Carver	Measuring Instruments	Cooper	Wood Wool, Matches
<i>Acer campestre</i>								
Field Maple, Common Maple			g,n,f,e,c,l,d,f,h,t	g,n,f,d,h,t	g,n,f,e,c,l,d,f,g,h,t			
<i>Alnus glutinosa</i>								
Black Alder, Common Alder	n	g,n,f,e,c,l,d,f,e,f,f,g,t	g,n,f,e,c,l,d,g,t	n,e,d,f,f,t	g,n,f,e,c,l,d,f,g,t			n
<i>Betula verrucosa (pendula)</i>								
Common Birch, Silver birch	n	g,n,f,e,d,g,t,h,t	g,n,f,e,c,l,d,f,f,g,h,t	g,n,f,e,c,l,d,f,f,g,h,t			n,d,f,f,t	
<i>Carpinus betulus</i>								
Common Hornbeam	f	e,d,t	g	g,n,f,e,c,l,d,f,f,g,h,t	g,n,f,e,c,l,d,g,t	n	d,t	
<i>Castanea vesca</i>								
Spanish or Sweet Chestnut	g,n,c,l,d,f,g,t	g,n,f,e,e,f,g,t	n,f,c,l,d,g,t	g,d,t	n		g,n,f,e,c,l,d,f,g,t	
<i>Fagus sylvatica</i>								
Copper or Common Beech	i,g,f,e,n,a,d,g,t	j,e,n,a,d,t	i,g,f,e,n,a,d,m,c,l,d,t,g,t	i,g,f,e,n,a,m,c,l,d,t,g,t	g,f,j,n,a,d,t,g,t		n,c,l,d,t,g,t	
<i>Fraxinus excelsior</i>								
Europ. Ash, Common Ash	j,a,n,d	j,a	j,a,n,e,f,d,m,c,l,d,t,g,t	j,a,n,e,f,d,m,c,l,d,t,g,t	a,c,t,d,t,g,t	d,t	j,a,n,d,t	
<i>Juglans regia</i>								
Common Walnut	g,n		j,g,n,f,e,a,c,t,d,t,g,t	j,g,n,e,a,c,t,t	j,g,n,f,e,a,c,t,d,t			
<i>Quercus robur</i>								
Common Oak, English Oak	g,n,f,e,c,l,d,f,e,f,g,t,h,t	g,n,f,e,c,l,d,f,e,f,g,t	g,n,f,e,d,f,e,f,g,t,h,t	n,j,e,d,f,e,f,g,t	n,j,f,d,f,t		g,n,f,e,c,l,d,f,e,f,g,t	
<i>Robinia pseudoacacia</i>								
Black Locust, False Acacia	g,n,f,g,t,h,t	g,n,c,l,d,f,g,t	n,e,c,l,d,f,h,t	g,j,e,n,a,d,f,e,t	n,j,e,c,l,d,f,h,t		n,g,t	
<i>Ulmus campestris</i>								
Field Elm, Elm, Spach	n	g,n,e,c,t,d,t	g,n,f,e,t,g,t,h,t	g,n,f,e,t,g,t,h,t	g,n,c,l,d,t,g,t,h,t			
<i>Sorbus torminalis</i>								
Wild Service Tree			d,e,f,a,g,c,t,d,t	e,n,a,d,t	a,g,c,t,d,t	e,n,a,g,d,t		
<i>Abies pectinata (alba)</i>								
Common Silver Fir, White Fir	g,n,f,e,c,l,d,f,e,f,g,t,h,t	g,n,j,d,g,t	n,f,e,c,l,d,h,t	f,t			g,n,j,e,d,t	
<i>Larix europaea</i>								
European Larch	n,j,f,e,c,l,d,f,e,f,h,t	g,n,f,e,c,l,d,f,h,t	n,j,f,e,c,l,d,h,t	n	n,h,t		g,n,d,t	n
<i>Pinus silvestris</i>								
Pine	g,n,f,e,d,f,f,g,t,h,t	g,n,f,e,c,l,d,f,e,f,g,t	n,j,f,e,d,f,f,g,t,h,t	g,n,e	f		n,j,d,t	g,n,e

Goals

- creating a review of old literature and an overview of what has been known, and where the knowledge can be found
- finding specific uses, for wood species and byproducts, which are not conventional nowadays
- comparison of documented properties with up to date data, especially for wood species not common in use
- comparison of data found in the literature with data from other projects dealing with, for example, objects from museums
- finding the crucial property for a certain utilization

Issues

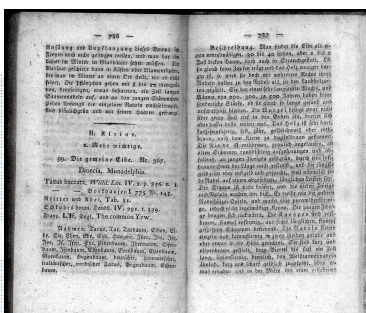
- defining vague formulations, like “quite light” or “pretty elastic”
- handling partly contradictory statements
- sometimes the connection between properties and utilizations is not comprehensible

Properties

Wood species	Density		Durability		Strength		Elasticity		Cleavability		Form stability		Fibrousness	
	high	low	high	low	high	low	high	low	bad	good	high	low	fine	raw
<i>Acer campestre</i>														
Field Maple, Common Maple	d,t				g,n,c,t,d,t,g,t		g,d,t		e,b,t,d,t,g,t,h,t		f,c,t,d,t,g,t		e,b,t,c,t,d,t,h,t	
<i>Alnus glutinosa</i>														
Black Alder, Common Alder	d,h,t				a,g,c,t,d,t		f,n,d,t,e,t		n,b,t,c,t,d,t,e,t,h,t		f,a,d,t,g,t	g,c,t	n,b,t,c,t,d,t,h,t	
<i>Betula verrucosa (pendula)</i>														
Common Birch, Silver birch	d,t				e	d,t	e,d,t		f,b,t,d,t,g,t,h,t	c,t	g,e,n,c,t,d,t		b,t,d,t,h,t	
<i>Carpinus betulus</i>														
Common Hornbeam	g,j,e,n,c,t,d,t,e,t		e		f,e,g,n,c,t,d,t,g,t,h,t		c,d,t	g,t	g,f,e,n,b,t,d,t,g,t		f,g,c,t,d,t,g,t,h,t		g,b,t,d,t	
<i>Castanea vesca</i>														
Spanish or Sweet Chestnut	c,d,t		f,d,t,g,t		c,d,t		d,t		n,b,t,c,t,d,t,g,t		d,t	f,n	n,b,t,d,t	
<i>Fagus sylvatica</i>														
Copper or Common Beech	e,n,f,c,t				j,c,t,d,t,g,t	e,f,n	a,c,t,d,t		f,n,d,d,t,g,t		f,e,n,d,t,g,t		n,c,t,d,t	
<i>Fraxinus excelsior</i>														
Europ. Ash, Common Ash	j,f,c,t		a,g,t		a,n,d,g,d,t,g,t		n,e,c,t,d,t		d,t,g,t	n,f	f,c,t,d,t,g,t		a,n,d,t,h,t	
<i>Juglans regia</i>														
Common Walnut			g,n,f,d,t		g,d,t		d,t,h		n,f,d,t,g,t	n,j,c,t,d,t			n,f,d,t	
<i>Quercus robur</i>														
Common Oak, English Oak	f,j,d,t		f,j,n,b,t,d,t,g,t		f,j,n,c,t,d,t		n,d,t		f,g,n,b,t,d,t,g,t	d,t,g	g,t		b,t,d,t	
<i>Robinia pseudoacacia</i>														
Black Locust, False Acacia	g,j,e,n,d,t		f,a,n,b,t,d,t,g,t		g,e,n,c,t,d,t		g,f,e,d,t,g,t		f,a,n,b,t,d,t,g,t		f,n,d,t	n	e	
<i>Ulmus campestris</i>														
Field Elm, Elm, Spach	d,t		e,b,t,c,t,d,t,g,t		g,n,c,t,d,t,g,t		g,c,t,d,t		g,e,n,b,t,c,t,d,t,g,t		n,c,t,d,t		b,t,d,t,h,t	
<i>Sorbus torminalis</i>														
Wild Service Tree	e,a,g	n	d,e,n,a,d,t		e,n,d,t		e,n,f,g,d,t	a,c,t		g,d,t		g,d,n,a,d,t		
<i>Abies pectinata (alba)</i>														
Common Silver Fir, White Fir	g,f,h,a,c,t,d,t		f,d,t	d,t	e,t		f,d,t		g,f,c,t,d,t,h,t		g,f,n,d,t		d,t,g,t,h,t	
<i>Larix europaea</i>														
European Larch	c,t		g,f,e,n,b,t,c,t,d,t		g,f,n,c,t,d,t		c,t,g,t	f,n	n,b,t,d,t		f,a,c,t,d,t		b,t,d,t	
<i>Pinus silvestris</i>														
Pine	c,t	d,t	f,a,n,b,t,c,t,d,t,g,t		e,n,c,t,d,t	c,t	f,d,t,g,t		b,t,c,t,d,t,g,t		g,f,d,t	c,t	n,b,t,d,t,g,t	

Conclusion

The connection between property and utilization is certainly given, but there are some missing links. For example: it is not obvious why *Alnus glutinosa* has been used in hydraulic and outdoor engineering, the properties usually decisive for this utilization are not achieved by *Alnus glutinosa*. Another explanation for unexpected applications may be the local availability of the actually most suitable wood species.



old literature: excerpt from Bechsteins Forstbotanik oder vollständige Naturgeschichte der deutschen Holzpflanzen und einiger fremden, 1812