The historical wood collection of the University of Genoa: revision and economic value estimation

Dagnino D. & Mariotti M.G. - Department of Science of Earth, Environment and Life (DISTAV), Università degli Studi di Genova, Viale Benedetto XV, 16132 Genova, Italy.
Correspondence: dagnino.botanica@gmail.com

Appendix 1 – Detailed description and numeric values of the coefficients used in the assessment of the economic value of the Xylarium of the University of Genoa.

$$V_{tot} = Vb \times (1+\sum Sh) \times Sz \times (1+T) \times (1+U) \times A \times [1-C] \times DD$$

BASE VALUE

Description	Geographic origin of the sample	Base Value
Vb = Base Value. Because the information about the original purchase cost of the wood samples is not available, we follow the approach of the "replacement value" (i.e., the base value equals the monetary cost that it would be necessary to face to re-obtain the wood sample). As the purchase cost of small wood sample is currently very low, the main cost is caused by the shipping fees. Following these considerations, three different base values according to the geographic origin of the sample, which is critical in determining the shipping cost to Italy, were considered.	Europe	5 €
	Africa, America	10 €
	Australia	15 €

DIRECT-USE VALUE

Description	Feature	Coefficient
Sh = Shape coefficient. The possibility of observing the greatest number of anatomical features of a sample is critical to determine its potential use for scientific and educational purposes. Consequently, the presence of all the three fundamental sections (i.e., cross, radial and tangential) determine a cumulative increase of the value, as well as the presence of a polished surface and of a portion of bark; conversely, an irregular shape determine an overall decrease of the total value. The value of Sh results from the sum of all items.	cross section visible	0.1
	radial section visible	0.1
	tangential section visible	0.1
	bark presence	0.1
	polished surface presence (only if the unpolished corresponding surface is visible too)	0.1
	no visible sections	-1.2
Sz = Size coefficient. Although there is no standard measure for wood samples, it is accepted that too small size is unsuited for some uses. Consequently, this coefficient can decrease the value or to leave it unchanged. Very small sized samples (i.e., few centimeters) obtain a coefficient lower than 1, while larger samples obtain a coefficient equals to 1.	medium or large	1
	small (few centimeters)	0.8
T = Threatened species. All records relating to endangered species are of particular interest for both scientific and educational reasons; consequently, samples referring to species listed in the IUCN risk categories (sub-coefficient T1) and/or in the CITES appendices (sub-coefficient T2) obtained a positive coefficient. The T coefficient is the sum of T1 and T2.	*T1 – IUCN categories*	
	EX	3
	EW	1
	CR	0.5
	EN	0.3
	VU	0.2
	NT – LC	0.1
	DD – NE	0
	T2 – CITES appendices	

	Appendix I	0.5
	Appendix II	0.3
	Appendix III	0.1
	no Appendix	0

UNICITY VALUE

Description	**Feature**	**Coefficient**
U = Unicity coefficient. Positive cumulative values were attributed to those samples that are linked to a particular historical event or famous collector.	Sample linked to the Columbian Celebrations of 1892	0.2
	The collector is also the species author*	0.3
	The collector is O. Penzig	0.3
	The collector is F. von Mueller	0.1
	Presence of original writings on the sample**	0.1

MIXED VALUE (both direct-use and unicity value)

Description	**Feature**	**Coefficient**
A = Age coefficient. Although some uses of wood samples do not depend on the age of the sample, it is known that the direct-use value of samples in some applications (e.g., dendrochronological studies, reconstruction of past distributions, etc.) is strongly age-dependent. Moreover, the antiquity of a sample can enhance its unicity value (e.g., samples deriving from living botanical collections no longer existing today, samples collected in natural environments now destroyed, etc.). Following these considerations, the age coefficient is greater for older samples and equals 1 in very recent samples (i.e., not affecting the VET); only if the age of the sample is unknown this coefficient is lower than 1, thus resulting in a reduction of the specimen value.	‘800 (label reporting year is present)	1.5
	from the end of ‘800 to the first decade of ‘900 (label reporting year is not present)	1.3
	from 1910 to 1950	1.1
	from 1950 to current day	1
	Unknown age	0.8

NEGATIVE FEATURES

Description	**Feature**	**Coefficient**
C = Conservation status. A poor conservation status can affect both the potentiality of direct-use of a given sample and its unicity value. This may happen through the irreversible degradation or destruction of samples (that prevents the potential use for both scientific and educational purposes – sub-coefficient C1) or labels (that introduces uncertainty in the determination of the geographical and historical origin of the sample – sub-coefficient C2). The C coefficient is the sum of C1 and C2.	***C1 – Sample damage caused by xylophagous insects***	
	Null	0
	Low	0.1
	Moderate	0.2
	High	0.3
	C2 – Labels damage	
	Null	0
	Low (writings are still totally legible)	0.1
	Moderate (writings are partially illegible)	0.3
	High (absent or fragmented labels, with illegible writings)	0.4

DD = Data Deficiency. This coefficient is applied to decrease the value of sample for which there are incomplete data. Regardless of the cause, the lack of information can be considered as reversible, if further analysis can fill the gap (e.g., incompleteness of the botanical origin of a sample – sub-coefficient DD1) or irreversible, if there is no way to recover the lost information (e.g., incompleteness of the geographical and historical origin of the sample – sub-coefficient DD2). The DD coefficient is the product of DD1 and DD2.

DD1 – Botanical origin	
Known botanical origin (species name)	1
Only the Genus name is known	0.8
Only the common species name is known	0.8
Unknown botanical origin (no species name)	0.75
DD2 – Geographical and historical origin	
Known geographical and historical origin	1
Uncertain geographical and historical origin	0.5
Unknown geographical and historical origin	0.25

*even if the current nomenclature takes the species into synonymy with another one that is described by another author.

**only pencil or china writings, legible and understandable, not composed only of numbers.