SERVICE
Wood Biology

OUR REFERENCE
exp_439 up to exp_462

YOUR REFERENCE
FE90 0086 up to FX97 0552

DATE
25-09-2023

NAME CONTACT
ENFORCE (Michael Monnoye/Maaike De Ridder)

E-MAIL CONTACT
enforce@africamuseum.be

PHONE CONTACT
+32 2 769 53 88

CONCERNS
EXPERTISE OF 24 ETHNOGRAPHICAL OBJECTS

ENFORCE – Centre for Forensic Wood Research

Report Expertise

This report concerns the macro- and microscopic wood identification of the samples received with references listed below.

Reference: exp_439 up to exp_462
Date received: 26-07-2023
Date report: 25-09-2023

Name client: Marc L. Félix
Contact: Congo Arts
Sint-Jakobsgang 2, 1000 Brussels
felix@congoarts.com

Sample Description

A series of 24 ethnographical objects were presented for identification. No declarations were made but information on the origin (regions/tribes in Tanzania) was provided.
See pictures listed below:

Our reference	Your reference	Picture
exp_439	FE90 0086	

Royal Museum for Central Africa
Service of Wood Biology
Leuvensesteenweg 13
3080 Tervuren, Belgium

ENFORCE
https://enforce.africamuseum.be
enforce@africamuseum.be

exp_440	FX98 0843	
exp_441	FE89 0516	
exp_442	FE90 0088	
exp_443	FE89 0274	
exp_444	TANZ 0009	
exp_445	FX06 0075	

Royal Museum for Central Africa
Service of Wood Biology
Leuvensesteenweg 13
3080 Tervuren, Belgium

ENFORCE
https://enforce.africamuseum.be
enforce@africamuseum.be

exp_446	FX97 0428	
exp_447	FC90 0212	
exp_448	FE22 0011	
exp_449	FE22 0013	
exp_450	FE89 0323	

Royal Museum for Central Africa
Service of Wood Biology
Leuvensesteenweg 13
3080 Tervuren, Belgium

ENFORCE
https://enforce.africamuseum.be
enforce@africamuseum.be

exp_451	FX98 0875	
exp_452	FE88 0159	
exp_453	FC87 0155	
exp_454	FX98 0126	
exp_455	FE87 0017	
exp_456	FE88 0050	

Royal Museum for Central Africa
Service of Wood Biology
Leuvensesteenweg 13
3080 Tervuren, Belgium

ENFORCE
https://enforce.africamuseum.be
enforce@africamuseum.be

exp_457	FE90 0061	
exp_458	FX92 0339	
exp_459	FE89 0410	
exp_460	FX97 0972	
exp_461	FE88 0124	
exp_462	FX97 0552	

Treatment

Small splinters were removed from the sample and immersed in PEG (polyethylene glycol) (ref. Lab Protocol). Thin sections were made in transversal, tangential and radial plane using a microtome. These were stained with Safranine 0 and Alcian Blue. To aid with identification, statues with a flat base were lightly sanded on the bottom. The anatomical features (ref. IAWA List) were studied with an optical microscope. These features were compared with reference material online (ref. InsideWood) and in the xylarium of the Service of Wood Biology.

Anatomical Features

Exp_439

N° (IAWA)	Presence*	Feature Description
9	p	Vessels exclusively solitary (90% or more)
27	a	Large intervessel pits - >= 10 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
63	p	Fibre pits common in both radial and tangential walls
66	p	Non-septate fibres present
100	p	Rays with multiseriate portion(s) as wide as uniseriate portions
179	p	Tropical Africa

Exp_440

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
27	a	Large intervessel pits - >= 10 µm
43	a	Mean tangential diameter of vessel lumina >= 200 µm
62	p	Fibres with distinctly bordered pits
69	p	Fibres thin- to thick-walled
77	p	Axial parenchyma diffuse-in-aggregates
100	p	Rays with multiseriate portion(s) as wide as uniseriate portions
179	p	Tropical Africa

Exp_441

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
25	p	Small intervessel pits - 4 - 7 µm
86	p	Axial parenchyma in narrow bands or lines up to three cells wide
136	p	Prismatic crystals present
179	p	Tropical Africa
202	p	Heartwood not as above

Exp_442

N° (IAWA)	Presence*	Feature Description
27	p	Large intervessel pits - >= 10 µm
31	p	Vessel-ray pits with much reduced borders to apparently simple: pits rounded or angular
42	p	Mean tangential diameter of vessel lumina 100 - 200 µm
65	p	Septate fibres present
68	p	Fibres very thin-walled
97	p	Ray width 1 to 3 cells
106	p	Body ray cells procumbent with one row of upright and / or square marginal cells
107	v	Body ray cells procumbent with mostly 2-4 rows of upright and / or square marginal cells
130	p	Radial canals
136	p	Prismatic crystals present
137	p	Prismatic crystals in upright and / or square ray cells
138	p	Prismatic crystals in procumbent ray cells
159	p	Silica bodies present
179	p	Tropical Africa

Exp_443

N° (IAWA)	Presence*	Feature Description
26	p	Medium intervessel pits - 7 - 10 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
42	a	Mean tangential diameter of vessel lumina 100 - 200 µm
43	a	Mean tangential diameter of vessel lumina >= 200 µm
58	p	Gums and other deposits in heartwood vessels
77	p	Axial parenchyma diffuse-in-aggregates
96	p	Rays exclusively uniseriate
104	p	All ray cells procumbent
179	p	Tropical Africa

Exp_444

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
58	p	Gums and other deposits in heartwood vessels
66	p	Non-septate fibres present
85	p	Axial parenchyma bands more than three cells wide
91	p	Two cells per parenchyma strand
97	p	Ray width 1 to 3 cells
104	p	All ray cells procumbent
142	p	Prismatic crystals in chambered axial parenchyma cells
179	p	Tropical Africa

Exp_445

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
9	p	Vessels exclusively solitary (90% or more)
24	p	Minute intervessel pits - <= 4 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
66	p	Non-septate fibres present
68	a	Fibres very thin-walled
77	p	Axial parenchyma diffuse-in-aggregates
97	p	Ray width 1 to 3 cells
113	p	Disjunctive ray parenchyma cell walls
179	p	Tropical Africa

Exp_446

N° (IAWA)	Presence*	Feature Description
82	p	Axial parenchyma winged-aliform
91	p	Two cells per parenchyma strand
96	p	Rays exclusively uniseriate
104	p	All ray cells procumbent
118	p	All rays storied
120	p	Axial parenchyma and / or vessel elements storied
136	p	Prismatic crystals present
142	p	Prismatic crystals in chambered axial parenchyma cells
179	p	Tropical Africa

Exp_447

N° (IAWA)	Presence*	Feature Description
10	p	Vessels in radial multiples of 4 or more common
24	p	Minute intervessel pits - <= 4 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
42	a	Mean tangential diameter of vessel lumina 100 - 200 µm
43	a	Mean tangential diameter of vessel lumina >= 200 µm
65	p	Septate fibres present
96	a	Rays exclusively uniseriate
99	a	Larger rays commonly > 10-seriate
106	p	Body ray cells procumbent with one row of upright and / or square marginal cells
107	p	Body ray cells procumbent with mostly 2-4 rows of upright and / or square marginal cells
179	p	Tropical Africa

Exp_448

N° (IAWA)	Presence*	Feature Description
25	p	Small intervessel pits - 4 - 7 µm
58	p	Gums and other deposits in heartwood vessels
81	p	Axial parenchyma lozenge-aliform
83	p	Axial parenchyma confluent
89	p	Axial parenchyma in marginal or in seemingly marginal bands
91	p	Two cells per parenchyma strand
96	p	Rays exclusively uniseriate
97	v	Ray width 1 to 3 cells
179	p	Tropical Africa

Exp_449

N° (IAWA)	Presence*	Feature Description
25	p	Small intervessel pits - 4 - 7 µm
58	p	Gums and other deposits in heartwood vessels
81	p	Axial parenchyma lozenge-aliform
83	p	Axial parenchyma confluent
89	p	Axial parenchyma in marginal or in seemingly marginal bands
91	p	Two cells per parenchyma strand
96	v	Rays exclusively uniseriate
97	v	Ray width 1 to 3 cells
179	p	Tropical Africa

Exp_450

N° (IAWA)	Presence*	Feature Description
25	p	Small intervessel pits - 4 - 7 µm
58	p	Gums and other deposits in heartwood vessels
98	a	Larger rays commonly 4 - to 10 seriate
109	p	Rays with procumbent, square and upright cells mixed throughout the ray
136	p	Prismatic crystals present
138	p	Prismatic crystals in procumbent ray cells
154	p	More than one crystal of about the same size per cell or chamber
179	p	Tropical Africa

Exp_451

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
42	p	Mean tangential diameter of vessel lumina 100 - 200 µm
58	p	Gums and other deposits in heartwood vessels
82	p	Axial parenchyma winged-aliform
91	p	Two cells per parenchyma strand
96	p	Rays exclusively uniseriate
104	p	All ray cells procumbent
118	p	All rays storied
120	p	Axial parenchyma and / or vessel elements storied

Exp_452

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
24	p	Minute intervessel pits - <= 4 µm
29	a	Vestured pits
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
66	p	Non-septate fibres present
69	p	Fibres thin- to thick-walled
85	v	Axial parenchyma bands more than three cells wide
89	v	Axial parenchyma in marginal or in seemingly marginal bands
93	p	Eight (5-8) cells per parenchyma strand
97	p	Ray width 1 to 3 cells
100	p	Rays with multiseriate portion(s) as wide as uniseriate portions
104	p	All ray cells procumbent
109	v	Rays with procumbent, square and upright cells mixed throughout the ray

Exp_453

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
22	p	Intervessel pits alternate
24	a	Minute intervessel pits - <= 4 µm
29	a	Vestured pits
41	p	Mean tangential diameter of vessel lumina 50 - 100 µm
47	p	5 - 20 vessels per square millimetre
97	p	Ray width 1 to 3 cells
130	p	Radial canals
136	p	Prismatic crystals present

Exp_454

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
27	p	Large intervessel pits - >= 10 µm
29	a	Vestured pits
31	p	Vessel-ray pits with much reduced borders to apparently simple: pits rounded or angular
46	p	<= 5 vessels per square millimetre
93	p	Eight (5-8) cells per parenchyma strand
96	p	Rays exclusively uniseriate
109	p	Rays with procumbent, square and upright cells mixed throughout the ray
115	p	Rays per millimetre 4-12 / mm
136	p	Prismatic crystals present

Exp_455

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
27	p	Large intervessel pits - >= 10 µm
29	a	Vestured pits
31	p	Vessel-ray pits with much reduced borders to apparently simple: pits rounded or angular
46	p	<= 5 vessels per square millimetre
93	p	Eight (5-8) cells per parenchyma strand
96	p	Rays exclusively uniseriate
109	p	Rays with procumbent, square and upright cells mixed throughout the ray
115	p	Rays per millimetre 4-12 / mm
136	p	Prismatic crystals present

Exp_456

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
27	p	Large intervessel pits - >= 10 µm
29	a	Vestured pits
31	p	Vessel-ray pits with much reduced borders to apparently simple: pits rounded or angular
46	p	<= 5 vessels per square millimetre
93	p	Eight (5-8) cells per parenchyma strand
96	p	Rays exclusively uniseriate
109	p	Rays with procumbent, square and upright cells mixed throughout the ray
115	p	Rays per millimetre 4-12 / mm
136	p	Prismatic crystals present

Exp_457

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
22	p	Intervessel pits alternate
24	p	Minute intervessel pits - <= 4 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
40	p	Mean tangential diameter of vessel lumina <= 50 µm
48	p	20 - 40 vessels per square millimetre
66	p	Non-septate fibres present
75	p	Axial parenchyma absent or extremely rare
97	p	Ray width 1 to 3 cells
108	p	Body ray cells procumbent with over 4 rows of upright and / or square marginal cells
116	p	Rays per millimetre >= 12 /mm

Exp_458

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
22	p	Intervessel pits alternate
24	p	Minute intervessel pits - <= 4 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
40	p	Mean tangential diameter of vessel lumina <= 50 µm
66	p	Non-septate fibres present
96	p	Rays exclusively uniseriate
105	p	All ray cells upright and / or square

Exp_459

N° (IAWA)	Presence*	Feature Description
22	a	Intervessel pits alternate
24	a	Minute intervessel pits - <= 4 µm
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
76	p	Axial parenchyma diffuse
77	p	Axial parenchyma diffuse-in-aggregates
80	p	Axial parenchyma aliform
82	p	Axial parenchyma winged-aliform
96	p	Rays exclusively uniseriate
104	p	All ray cells procumbent
115	p	Rays per millimetre 4-12 / mm
142	p	Prismatic crystals in chambered axial parenchyma cells

Exp_460

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
22	p	Intervessel pits alternate
27	a	Large intervessel pits - >= 10 µm
58	p	Gums and other deposits in heartwood vessels
66	p	Non-septate fibres present
81	p	Axial parenchyma lozenge-aliform
89	p	Axial parenchyma in marginal or in seemingly marginal bands
97	p	Ray width 1 to 3 cells
104	p	All ray cells procumbent

Exp_461

N° (IAWA)	Presence*	Feature Description
22	p	Intervessel pits alternate
25	p	Small intervessel pits - 4 - 7 µm
32	p	Vessel-ray pits with much reduced borders to apparently simple: pits horizontal (scalariform, gash-like) to vertical (palisade)
41	p	Mean tangential diameter of vessel lumina 50 - 100 µm
47	p	5 - 20 vessels per square millimetre
58	p	Gums and other deposits in heartwood vessels
66	p	Non-septate fibres present
93	p	Eight (5-8) cells per parenchyma strand
97	p	Ray width 1 to 3 cells
109	p	Rays with procumbent, square and upright cells mixed throughout the ray

Exp_462

N° (IAWA)	Presence*	Feature Description
5	p	Wood diffuse-porous
22	p	Intervessel pits alternate
29	a	Vestured pits
30	p	Vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell
58	p	Gums and other deposits in heartwood vessels
66	p	Non-septate fibres present
97	p	Ray width 1 to 3 cells
104	p	All ray cells procumbent

*(p = present, a = absent, v = variable)

Conclusion

code	family	genus	species
exp_439	*Rubiaceae*	*Feretia*	spp
exp_440	*Rubiaceae*	-	-
exp_441	*Leguminosae Papilionoideae*	*Dalbergia*	cfr *melanoxylon*
exp_442	*Burseraceae*	cfr *Commiphora*	spp
exp_443	*Euphorbiaceae*	*Spirostachys*	cfr *africana*
exp_444	*Leguminosae Caesalpiniodeae*	cfr *Cassia*	spp
exp_445	*Rubiaceae*	*Aidia*	spp
exp_446	*Leguminosae Caesalpiniodeae*	*Pterocarpus*	*angolensis*
exp_447	*Oleaceae*	*Schrebera*	spp
exp_448	*Leguminosae Caesalpiniodeae*	*Brachystegia*	cfr *boehmii*
exp_449	*Leguminosae Caesalpiniodeae*	*Brachystegia*	spp
exp_450	*Rhamnaceae*	*Ziziphus*	*mauritiana*
exp_451	*Leguminosae Papilionoideae*	*Pterocarpus*	*angolensis*
exp_452	*Sapindaceae*	-	
exp_453	*Anacardiaceae*	*Sclerocarya*	*birrea*
exp_454	*Euphorbiaceae*	*Ricinodendron*	*heudelotii*
exp_455	*Euphorbiaceae*	*Ricinodendron*	*heudelotii*
exp_456	*Euphorbiaceae*	*Ricinodendron*	*heudelotii*
exp_457	*Rubiaceae*	*Gardenia*	cfr *imperialis*
exp_458	*Rhamnaceae*	*Lasiodiscus*	cfr *mildbraedii*
exp_459	*Leguminosae Papilionoideae*	*Dalbergia*	*melanoxylon*
exp_460	*Leguminosae Caesalpiniodeae*	*Afzelia*	*quanzensis*
exp_461	cfr *Phyllanthaceae*	-	
exp_462	*Rutaceae*	*Zanthoxylum*	*gilletii*

The addition of “cfr” indicates a high resemblance of the expertise sample to the listed family, genus or species but without a 100% level of certainty. The uncertainty of some of the results is partly due to the limitation of the small sample sizes. For three of the samples (exp_440, exp_452 and exp_461) there was not enough information to draw a conclusion on the genus and species level.

References

Schmitz, Nele. (2010). Lab protocol for basic wood anatomy procedures: making and staining of micro-sections of wood samples.

Wheeler, Elisabeth & Baas, Pieter & Gasson, Peter. (1989). IAWA List of Microcopie Features for Hardwood Identification. IAWA journal / International Association of Wood Anatomists. 10. 219–332.

InsideWood. 2004-onwards. Published on the Internet. http://insidewood.lib.ncsu.edu/search

Royal Museum for Central Africa
Service of Wood Biology
Leuvensesteenweg 13
3080 Tervuren, Belgium

ENFORCE
https://enforce.africamuseum.be
enforce@africamuseum.be