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***Tectona grandis* Linn. f. secondary metabolites and their bioactive potential: a review**
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Supplementary Material

Tab. S2 - Summary of secondary metabolites in *Tectona grandis* heartwood.

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
Naphthoquinones				
4-hydroxy-3-(3-methylbut-2-enyl) naphthalene-1,2-dione	Lapachol 2-hydroxy-3-(3-methyl-2-butenyl)-1,4-naphthoquinone	$C_{15}H_{14}O_3$ 84-79-7	Ethanol: benzene	(Lukmandaru & Takahashi 2009, Lukmandaru 2012b)
			Ethyl acetate	(Lukmandaru 2015b)
			n-hexane	(Lukmandaru 2015b)
			Petrol	(Singh et al. 1989, Khan & Mlungwana 1999)
			Chloroform	(Gupta & Singh 2004)
			Acetone: water	(Niamké et al. 2011)
			Petroleum ether	(Windeisen et al. 2003)
			Acetone (dichloromethane-soluble fraction)	(Windeisen et al. 2003)
			Chloroform	(Gupta & Singh 2004)
			Chloroform: methanol	(Sumthong et al. 2008)
			Water: acetone	(Carrieri et al. 2014)
			Methanol	(Carrieri et al. 2014, Lukmandaru 2015b)

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
2-(3-methylbut-2-enyl) naphthalene-1,4-dione	Deoxylapachol	$C_{15}H_{14}O_2$ 3568-90-9	Petroleum ether	(Windeisen et al. 2003)
			Acetone (dichloromethane-soluble fraction)	(Windeisen et al. 2003)
			Ethanol: benzene	(Lukmandaru & Takahashi 2009, Lukmandaru 2012b)
			Ethyl acetate	(Lukmandaru 2015b)
			n-hexane	(Lukmandaru 2015b)
			Chloroform	(Gupta & Singh 2004)
			Chloroform: methanol	(Sumthong et al. 2008)
			Water: acetone	(Carrieri et al. 2014)
			Methanol	(Carrieri et al. 2014, Lukmandaru 2015b)
Isodeoxylapachol		$C_{15}H_{14}O_2$	Ethanol: benzene	(Lukmandaru & Takahashi 2009, Lukmandaru 2012b)
			Ethyl acetate	(Lukmandaru 2015b)
			n-hexane	(Lukmandaru 2015b)
			Methanol	(Lukmandaru 2015b)
			Acetone (dichloromethane-soluble fraction)	(Windeisen et al. 2003)
			Chloroform: methanol	(Sumthong et al. 2008)

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
2-[(1E)-3-hydroxy-3-methylbut-1-enyl] naphthoquinone	3'-OH-deoxyisolapachol		Chloroform: methanol	(Sumthong et al. 2008)
4,5-dihydroxy-3-(3-methylbut-2-enyl) naphthalene-1,2-dione	5-hydroxylapachol	$C_{15}H_{14}O_4$ 221350-50-1	Petrol	(Khan & Mlungwana 1999)
naphthalene-1,4-dione	1,4-naphtoquinone	$C_{10}H_6O_2$ 130-15-4	Ethanol: benzene	(Thulasidas & Bhat 2007)
			Acetone: water	(Niamké et al. 2011, Niamké et al. 2014)
Dehydro-α isodunnione		$C_{15}H_{12}O_3$	Chloroform	(Gupta & Singh 2004)
Naphthoquinone derivatives				
2,2-dimethylbenzo[g]chromene-5,10-quinone	Xyloidone Dehydro-α-lapachone	$C_{15}H_{12}O_3$ 15297-92-4	Chloroform	(Gupta & Singh 2004)
			Petrol	(Singh et al. 1989, Khan & Mlungwana 1999)
Dehydro-β-lapachone				(Neha & Sangeeta 2013)
5-(6-hydroxy-2,2-dimethylbenzo[h]chromen-5-yl)-2,2-dimethylbenzo[h]chromen-6-ol	Tectol	$C_{30}H_{26}O_4$ 24449-39-6	Ethanol: benzene	(Lukmandaru & Takahashi 2009, Lukmandaru 2012b)
			Chloroform	(Gupta & Singh 2004)
			Chloroform: methanol	(Sumthong et al. 2008)
			Methanol	(Windeisen et al. 2003)
2,2-dimethyl-2H-benzo[h]chromen-6-ol	Hemitectol		Chloroform: methanol	(Sumthong et al. 2008)
Tecomaquinone-I		$C3_0H_{24}O_4$ 89355-02-2	Chloroform	(Gupta & Singh 2004)
			Petrol	(Singh et al. 1989)

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
(5E)-5-(2,2-dimethyl-6-oxobenzo[h]chromen-5-ylidene)-2,2-dimethylbenzo[h]chromen-6-one	Dehydrotectol	$C_{30}H_{24}O_4$ 20213-28-9		(Neha & Sangeeta 2013)
4′,5′-dihydroxy-epiisocatalponol			Acetone: water	(Niamké et al. 2012, Niamké et al. 2014)
Anthraquinones				
2-methyl-9,10-anthracenedione	Tectoquinone 2-methylanthraquinone	$C_{15}H_{10}O_2$ 84-54-8	Ethanol: benzene	(Thulasidas & Bhat 2007, Lukmandaru & Takahashi 2009, Lukmandaru 2012b)
			n-hexane	(Lukmandaru 2012a, Lukmandaru 2015b)
			Ethyl acetate	(Lukmandaru 2015b)
			Methanol	(Lukmandaru 2015b)
			Acetone: water	(Niamké et al. 2011, Niamké et al. 2014)
			Ethanol: toluene	(Mankowski et al. 2016, Hassan et al. 2017)
			Petroleum ether	(Windeisen et al. 2003)
			Acetone (dichloromethane-soluble fraction)	(Windeisen et al. 2003)
			Chloroform	(Gupta & Singh 2004)
			Petrol	(Singh et al. 1989)
			Chloroform: methanol	(Sumthong et al. 2008)

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
9,10-dihydro-9,10-dioxo-2-anthracene carboxylic acid	Anthraquinone -2-carboxylic acid	$C_{15}H_8O_4$ 117-78-2	Acetone: water	(Niamké et al. 2011, Niamké et al. 2014)
2-hydroxymethyl anthracene-9,10-dione	2-hydroxymethyl-anthraquinone Anthraquinone-2-methanol	$C_{15}H_{10}O_3$ 17241-59-7	Petroleum ether	(Windeisen et al. 2003)
			Acetone (dichloromethane-soluble fraction)	(Windeisen et al. 2003)
			Chloroform: methanol	(Sumthong et al. 2008)
			Acetone: water	(Niamké et al. 2011, Niamké et al. 2014)
2-(1,1-dimethylethyl)-9,10-anthracenedione	2-tert-butylanthraquinone	$C_{18}H_{16}O_2$ 84-47-9	Acetone (dichloromethane-soluble fraction)	(Windeisen et al. 2003)
9,10-dimethoxy-2-methylanthracene-1,4-dione	9,10-dimethoxy-2-methyl-1,4-anthraquinone	$C_{17}H_{14}O_4$	Petrol	(Singh et al. 1989)
2,8-dihydroxy-1-methoxy-3-methylanthracene-9,10-dione	obtusifolin	$C_{16}H_{12}O_5$ 477-85-0		(Neha & Sangeeta 2013)
1-hydroxy-3-methylanthracene-9,10-dione	pachybasin	$C_{15}H_{10}O_3$ 2549-78-2		(Neha & Sangeeta 2013)
1,4-dihydroxy-2-methylanthraquinone	2-methylquinizarin	$C_{15}H_{10}O_4$ 2589-39-1	Petrol	(Khan & Mlungwana 1999)

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
Triterpenes				
2,6,10,15,19,23-hexamethyl-2,6,10,14,18,22-tetracosahexaene	Squalene	$C_{30}H_{50}$ 111-02-4	Ethanol: benzene	(Lukmandaru 2012b)
			Ethanol: toluene	(Mankowski et al. 2016, Hassan et al. 2017)
			Ethyl acetate	(Lukmandaru 2015b)
			n-hexane	(Lukmandaru 2012a, Lukmandaru 2015b)
			Methanol	(Lukmandaru 2015b)
			Petroleum ether	(Windeisen et al. 2003)
			Petrol	(Khan & Mlungwana 1999)
Fatty acids				
n-hexadecanoic acid	Palmitic acid	$C_{16}H_{32}O_2$ 57-10-3	Ethanol: benzene	(Lukmandaru & Takahashi 2009, Lukmandaru 2012b)
			Acetone	(Windeisen et al. 2003)
Sterols				
22,23-dihydrostigmasterol	β-sitosterol	$C_{29}H_{50}O$ 83-46-5		(Lukmandaru 2012a)
			Petroleum ether	(Windeisen et al. 2003)
Quinolines				
1-methyl-3,4-dihydroisoquinoline	3,4-dihydro-1-methylisoquinoline	$C_{10}H_{11}N$ 2412-58-0	Ethanol: toluene	(Mankowski et al. 2016, Hassan et al. 2017)

Chemical compound	Common name	Molecular formula/ CAS	Extraction solvent	References
Aromatic ether				
1-(1,1-dimethylethyl)-4-phenoxy-benzene	1-(tert-butyl)-4-phenoxybenzene	$C_{16}H_{18}O$ 5331-28-2	Ethanol: toluene	(Mankowski et al. 2016)

Tab. S2 - Summary of the bioactive potential of *Tectona grandis* extractives. (dw): dry weight.

***T. grandis* extract**	**Extraction method**	**Identified compound (content)**	**Bioassay**	**Results**	**Reference**
Methanolic (heartwood)	successive extraction (6 h, refluxed 3 times)		Brine shrimp lethality test	LC_{50} (ppm) >200	(Lukmandaru 2012a)
			Anti-termic test (*Reticulitermes speratus* Kolbe termites, 10 days)	Weight loss (mg): 21.32	
n-hexane (heartwood)	successive extraction (6 h, refluxed 3 times)		Brine shrimp lethality test	LC_{50} (ppm): 6.71	(Lukmandaru 2012a)
			Anti-termic test (*Reticulitermes speratus* Kolbe termites, 10 days)	Weight loss (mg): 8.37	
n-hexane/ unsaponifiable fraction (heartwood)	successive extraction (6 h, refluxed 3 times) after saponified with 1.3% ethanolic KOH	Squalene Tectoquinone	Brine shrimp lethality test	LC_{50} (ppm): 6.77	(Lukmandaru 2012a)
			Anti-termic test (*Reticulitermes speratus* Kolbe termites, 10 days)	Weight loss (mg): 8.34	
Ethyl acetate (heartwood)	successive extraction (6 h, refluxed 3 times)		Brine shrimp lethality test	LC_{50} (ppm): 6.60	(Lukmandaru 2012a)
			Anti-termic test (*Reticulitermes speratus* Kolbe termites, 10 days)	Weight loss (mg): 5.39	
Acetone: water (80: 20 v/ v, Malaysia)	Sonication (two times)	Tectoquinone (7.9 mg equivalent 5-methoxyflavone/ g dw in outer heartwood, 6.0 mg equivalent 5-methoxyflavone/ g dw in inner heartwood)	Antifungal test (*Antrodia* sp, 16 weeks)	Weight loss (%): 0.1- 14.5	(Niamké et al. 2011)
		2-(hydroxymethyl)anthraquinone (3.0 mg equivalent 5-methoxyflavone/ g dw in heartwood)			
		Anthraquinone-2-carboxylic acid (0.54 mg equivalent 5-methoxyflavone/ g dw in heartwood)			

***T. grandis* extract**	**Extraction method**	**Identified compound (content)**	**Bioassay**	**Results**	**Reference**
		1,4-naphthoquinone (0.13 mg equivalent 5-methoxyflavone/ dw in heartwood)			
		Lapachol (0.26 mg equivalent 5-methoxyflavone/ g dw in heartwood)			
Acetone: water (80: 20 v/ v, heartwood)	Sonication (two times, 45 min)	Tectoquinone (0.48 mg/ g dw to 17.72 mg/ g dw)			(Niamké et al. 2014)
		2-(hydroxymethyl)anthraquinone (0.07 mg/ g dw to 11.81 mg/ g dw)			
		Anthraquinone-2-carboxylic acid (0.03 mg/ g dw to 3.23 mg/ g dw)			
		1,4-naphthoquinone (0.0 mg/ g dw to 0.34 mg/ g dw)			
		4',5'-dihydroxyepiisocatalponol (0.0 mg/ g dw to 9.67 mg/ g dw)			
		Total phenolic (1.96 mg/ g dw to 43.58 mg/ g dw)			
Acetone: water (80: 20 v/ v, Malaysia heartwood)		4',5'-dihydroxyepiisocatalponol (0.0 mg/ g dw to 9.67 mg/ g dw)	Antifungal test (14 weeks) *T. versicolor*	Minimum inhibitory concentration: 0.22 mM IC_{50}: 0.11mM	(Niamké et al. 2012)
Ethanol: benzene (1: 2, wet location heartwood)	Soxhlet (8 h)	Total extractives (12.44%) Tectoquinone (0.23%) 1,4-naphthoquinone (0.62%)	Antifungal test (8 weeks) *P. palustris* *G. rabeum* *P. sanguineus* *T. hirsuta* *T. versicolor*	Weight loss (%): 43.30 7.05 1.86 2.76 1.94	(Thulasidas & Bhat 2007)

***T. grandis* extract**	**Extraction method**	**Identified compound (content)**	**Bioassay**	**Results**	**Reference**
Ethanol: benzene (1: 2, dry location heartwood)	Soxhlet (8 h)	Total extractives (15.98%) Tectoquinone (0.34%) 1,4-naphthoquinone (1.26%)	Antifungal test (8 weeks) *P. palustris* *G. rabeum* *P. sanguineus* *T. hirsuta* *T. versicolor*	Weight loss (%): 18.41 4.28 1.70 3.02 1.73	(Thulasidas & Bhat 2007)
Ethanol: benzene (1: 2, plantation heartwood, Kerala, India)	Soxhlet (8 h)	Total extractives (13.31%) Tectoquinone (0.32%) 1,4-naphthoquinone (0.97%)	Antifungal test (8 weeks) *P. palustris* *G. rabeum* *P. sanguineus* *T. hirsuta* *T. versicolor*	Weight loss (%): 26.88 2.34 2.06 2.16 1.65	(Thulasidas & Bhat 2007)
Aqueous (hot water, heartwood Brazil)	Maceration (autoclave, two times, 2.5 h)	Total extractives (6.56%)	Antifungal test (12 weeks, Teak wood substrate) *Postia placenta* *Gloeophyllum trabeum* *Neolentinus lepideus* *Trametes versicolor*	Weight loss (%): 11.93 21.12 2.39 10.82	(Brocco et al. 2017)
			Antifungal test (12 weeks, *Pinus* sp substrate) *Postia placenta* *Gloeophyllum trabeum* *Neolentinus lepideus* *Trametes versicolor*	Weight loss (%): 55.82 43.49 37.50 11.43	
Ethanolic (absolute ethanol, heartwood Brazil)	Maceration (two times, 24 h)	Total extractives (9.17%)	Antifungal test (12 weeks, Teak wood substrate) *Postia placenta* *Gloeophyllum trabeum* *Neolentinus lepideus* *Trametes versicolor*	Weight loss (%): 6.65 7.93 2.51 12.10	(Brocco et al. 2017)

***T. grandis* extract**	**Extraction method**	**Identified compound (content)**	**Bioassay**	**Results**	**Reference**
			Antifungal test (12 weeks, *Pinus* sp substrate) *Postia placenta* *Gloeophyllum trabeum* *Neolentinus lepideus* *Trametes versicolor*	Weight loss (%): 55.82 43.49 37.50 11.43	
Ethanol: water (1: 1, heartwood, Brazil)			Antifungal test (12 weeks, Teak wood substrate) *Postia placenta* *Gloeophyllum trabeum* *Neolentinus lepideus* *Trametes versicolor*	Weight loss (%): 5.32 5.51 3.20 10.48	(Brocco et al. 2017)
			Antifungal test (12 weeks, *Pinus* sp substrate) *Postia placenta* *Gloeophyllum trabeum* *Neolentinus lepideus* *Trametes versicolor*	Weight loss (%): 41.25 57.43 20.98 10.92	
Ethanol: toluene (2: 1, heartwood, Pittsburg, USA)	Soxhlet (6 h)	Squalene (28.24% of sample) 2-methyl-9,10-anthracenedione (24.03% of sample) 1-methyl-3,4-dihydroisoquinoline (5.22% of sample)	Anti-termic test *Reticulitermes flavipes Heterotermes indicola*	LC_{50} (mg/ ml): 4.43 3.21	(Hassan et al. 2017)

***T. grandis* extract**	**Extraction method**	**Identified compound (content)**	**Bioassay**	**Results**	**Reference**
Ethanol: toluene (2: 1, heartwood, Myanmar, India)	Soxhlet (6 h)	Total extractives (5.51%) 3-(1-hydroxyethyl)-2-methyl-1-benzofuran-5,6-dicarbonitrile (3.53% of sample) 1-(1,1-dimethylethyl)-4-phenoxy-benzene (3.06% of sample) 2-methyl-9,10-anthracenedione (24.03% of sample) 1-methyl-3,4-dihydroisoquinoline (28.24% of sample) Squalene (28.24% of sample)			(Mankowski et al. 2016)
Dichlorometane (bark, East Timor)	Soxtec (1.5 h)	1.6% of total dw			(Baptista et al. 2013)
Ethanol (bark, East Timor)	Soxtec (1.5 h)	2.9% of total dw 0.9% of ethanolic soluble phenolic compounds			(Baptista et al. 2013)
Water (bark, East Timor)	Soxtec (1.5 h)	6.1% of total dw 0.7% of water soluble phenolic compounds			(Baptista et al. 2013)
NaOH (Costa Rica)	ASTM D-1109-84 standard	Total extractives (23.83%)			(Moya et al. 2017)
Aqueous (hot water, Costa Rica)	ASTM D-1110-84 standard	Total extractives (7.22%)			(Moya et al. 2017)
Aqueous (cool water, Costa Rica)	ASTM D-1110-84 standard	Total extractives (8.51%)			(Moya et al. 2017)
Dichloromethane (Costa Rica)	ASTMD-1108-96 standard	Total extractives (13.01%)			(Moya et al. 2017)
Ethanol: toluene	ASTM D-1107-96 standard	Total extractives (1.18%)			(Moya et al. 2017)

Tab. S3 - Summary of secondary metabolites in *Tectona grandis* leaves.

Chemical compound	Extraction solvent	Reference
Phenolic compounds		
acetovanillone	water, DCM, EtOAc	(Lacret et al. 2012)
E-isofuraldehyde	water, DCM, EtOAc	(Lacret et al. 2012)
3-hydroxy-1-(4-hydroxy-3,5-dimethoxyphenyl)propan-1-one	water, DCM, EtOAc	(Lacret et al. 2012)
evofolin A	water, DCM, EtOAc	(Lacret et al. 2012)
gallic acid	methanol	(Nayeem & Karvekar 2010)
ellagic acid	methanol	(Nayeem & Karvekar 2010)
Naphthoquinones		
hydroxysesamone	methanol, EtOAc	(Kopa et al. 2014)
Anthraquinones		
3-acetoxy-8-hydroxy-2-methylanthraquinone (grandiquinone A)	methanol, EtOAc	(Kopa et al. 2014)
5,8-dihydroxy-2-methylanthraquinone	methanol, EtOAc	(Kopa et al. 2014)
3-hydroxy-2-methylanthraquinone	methanol, EtOAc	(Kopa et al. 2014)
quinizarine	methanol, EtOAc	(Kopa et al. 2014)
tectograndone	methanol, EtOAc	(Kopa et al. 2014)
anthratectone	water, DCM, EtOAc	(Lacret et al. 2011, Lanka & Parimala 2017)
naphthotectone	water, DCM, EtOAc	(Lacret et al. 2011, Lanka & Parimala 2017)
tectoleafquinone	acetone, benzene	(Agarwal et al. 1965)
Flavonoids		
rutin	methanol	(Nayeem & Karvekar 2010)

Chemical compound	**Extraction solvent**	**Reference**
quercitin	methanol	(Nayeem & Karvekar 2010)
Diterpenes		
abeograndinoic acid	water, DCM, EtOAc	(Macías et al. 2010)
2-oxokovalenic acid	water, DCM, EtOAc	(Macías et al. 2010)
19-hydroxyferruginol	water, DCM, EtOAc	(Macías et al. 2010)
tectograndinol	water, DCM, EtOAc	(Macías et al. 2010)
solidagonal acid		(Macías et al. 2010)
Triterpenes		
ursolic acid	methanol, EtOAc	(Kopa et al. 2014)
betulinic acid	methanol, EtOAc	(Kopa et al. 2014)
corosolic acid	methanol, EtOAc	(Kopa et al. 2014)
oleanolic acid	water, DCM, EtOAc	(Macías et al. 2010)
maslinic acid	water, DCM, EtOAc	(Macías et al. 2010)
methyl-2α,3α-dihydroxyurs-l2-en-28-oate	water, DCM, EtOAc	(Macías et al. 2010)
euscaphic acid	water, DCM, EtOAc	(Macías et al. 2010)
Sesquiterpenes		
lβ-6α-dihydroxy-4(15)-eudesmene	water, DCM, EtOAc	(Macías et al. 2010)
7-epieudesm-4(15)-ene-1α,6α-diol	water, DCM, EtOAc	(Macías et al. 2010)
Lignans		
syringaresinol	water, DCM, EtOAc	(Lacret et al. 2012)
medioresinol	water, DCM, EtOAc	(Lacret et al. 2012)

Chemical compound	Extraction solvent	Reference
1-hydroxypinoresinol	water, DCM, EtOAc	(Lacret et al. 2012)
lariciresinol	water, DCM, EtOAc	(Lacret et al. 2012)
balaphonin	water, DCM, EtOAc	(Lacret et al. 2012)
zhebeiresinol	water, DCM, EtOAc	(Lacret et al. 2012)
Norlignans		
(7Z)-9'nor-3',4,4'-trihydroxy-3-methoxylign-7-ene-9,7'-lactone (tectonoelin A)	water, DCM, EtOAc	(Lacret et al. 2012)
(7Z)-9'nor-3',4,4'-trihydroxy-3,5-dimethoxylign-7-ene-9,7'-lactone (tectonoelin B)	water, DCM, EtOAc	(Lacret et al. 2012)
Apocarotenoids		
3β-hydroxy-7,8-dihydro-β-ionone	water, DCM, EtOAc	(Macías et al. 2008)
9(S)-4-oxo-7,8-dihydro-β-ionol	water, DCM, EtOAc	(Macías et al. 2008)
3R,5R,6S,9R)-6,9-epoxiionane-3,5-diol (tectoionol A)	water, DCM, EtOAc	(Macías et al. 2008)
2-hydroxy-7,8-dihydro-β-ionol (tectoionol B)	water, DCM, EtOAc	(Macías et al. 2008)
3β-hydroxy-7,8-dihydro-β-ionol	water, DCM, EtOAc	(Macías et al. 2008)
Sterols		
sitosterol 3-O-β-D-glucopyranoside	methanol, EtOAc	(Kopa et al. 2014)
Fatty acids		
Benzene-1-carboxylic acid-2-hexadeconate	ethanol	(Sangeetha et al. 2017)
2-(butoxycarbonyl) benzoic acid	ethanol	(Sangeetha et al. 2017)
Alcohols		
3,7,11,15,tetramethyl-1- hexadecanol	ethanol	(Sangeetha et al. 2017)

Tab. S4 - *Tectona grandis* structural composition analysis. (G-units): Guaiacyl units; (S-units): Syringyl units; (H-units): p-hydroxyphenyl units.

***Tectona grandis* origin (age)**	**Lignin (wt. %)**	**Cellulose (wt. %)**	**Hemicellulose (wt. %)**	**Ash (wt. %)**	**Reference**
Bhumo, Myanmar	35.4 (trunk)	36.9 (trunk)	26.0 (trunk)		(Gašparík et al. 2019)
East Timor (70 year-old)	37.3 (heartwood, extractive-free): 20.3 G-units, 16.4 S-units, 0.7 H-units 35.4 (sapwood, extractive-free): 20.4 G-units, 14.4 S-units, 0.6 H-units 28.0 (bark, extractive-free): 14.9 G-units, 11.8 S-units, 1.3 H-units				(Lourenço et al. 2015)
East Timor (50- 70 year-old)	32.2 (heartwood) 32.4 (sapwood)				(Miranda et al. 2011)
East Timor (50- 60 year-old)	20 (bark, total lignin) 16 (bark, Klason lignin)			18.5 Ca: 93%, K: 4.8%, Mg: 1.9%	(Baptista et al. 2013)
Java, Indonesia (40 year-old, long rotation; 10 year-old, short rotation)	32.19 (long rotation) 35.53 (short rotation)	49.18 (long rotation 48.80 (short rotation)	19.35 (long rotation 18.70 (long rotation)		(Rizanti et al. 2018)
Randublatung, Java	30.33 (sapwood, extractive-free) 30.71- 30.02 (heartwood, extractive-free)	49.28 (sapwood, extractive-free) 44.84- 47.01 (heartwood, extractive-free)	29.67 (sapwood, extractive-free) 22.96- 27.04 (heartwood, extractive-free)	1.5	(Lukmandaru 2015a)
Costa Rica (6- 18 year-old)	21.9 (trunk)	54.4 (trunk)		2.81	(Moya et al. 2017)

***Tectona grandis* origin (age)**	**Lignin (wt. %)**	**Cellulose (wt. %)**	**Hemicellulose (wt. %)**	**Ash (wt. %)**	**Reference**
Panama (30 year-old)	33.3- 34.3 (heartwood) 33.9 (sapwood) 38.3 (transition)				(Windeisen et al. 2003)
Iloring, Nigeria (40- 45 year-old)	36.5 (tree lumber, dry-ash-free)			0.7	(Balogun et al. 2014)