

Fire escape strategy in savanna woody species

Supporting information Table S1-S5, Fig. S1

Table S1 Reference sources for the information in Table 1

	Afrotropical savannas	Neotropical savannas
Annual rainfall	Skowno <i>et al.</i> , 1999; Nygard & Elfving, 2000; Shackleton <i>et al.</i> , 2002; Kenedy & Ptgieter, 2003; Wilson & Witkowski, 2003; Assogbadjio <i>et al.</i> , 2006; Kakaï & Sinsin, 2009; Dayamba <i>et al.</i> , 2011.	García-Nuñes <i>et al.</i> , 2001; Hoffmann <i>et al.</i> , 2003; Zhang <i>et al.</i> , 2009; 11: Bernasol & Lima-Ribeiro, 2010; Souza, 2010; Araujo <i>et al.</i> , 2011.
Herbivory intensity	McNaughton, 1998.	Marquis <i>et al.</i> 2001; Costa <i>et al.</i> 2008.
Mean grass biomass	Shea, Shea & Kauffman 1996; Stocks <i>et al.</i> 1996; Hoffa <i>et al.</i> 1999; Abbadie <i>et al.</i> 2006.	Pivello & Coutinho 1992; Ward <i>et al.</i> 1992; Kauffman <i>et al.</i> , 1994; Castro & Kauffman 1998; Miranda, Bustamante & Miranda 2002.
Mean fuel load	Shea, Shea & Kauffman <i>et al.</i> 1996; Smith <i>et al.</i> 2005; Govender <i>et al.</i> 2006; Savadogo <i>et al.</i> 2007.	Ward <i>et al.</i> 1992; Kauffman, Cummings & Ward 1994; Castro & Kauffman 1998; Miranda, Bustamante & Miranda 2002; Bilbao <i>et al.</i> 2009.
Mean fireline intensity	Shea, Shea & Kauffman <i>et al.</i> , 1996; Hoffa <i>et al.</i> 1999; Stocks <i>et al.</i> 1996; Smith <i>et al.</i> 2005; Govender <i>et al.</i> , 2006.	Ward <i>et al.</i> 1992; Kauffman, Cummings & Ward 1994; Castro & Kauffman 1998; Misty 1998; Bilbao <i>et al.</i> 2009

Table S2 Data compiled for Afrotropical and Neotropical savannas. BT: Bark thickness; D: stem diameter; H: stem height, #sp: species number; N: number of individuals

Reference	Data	Data type	Ecozone	#sp	N
Nygaard & Elfving, 2000	BT vs D	mean	Afrotropical	43	43
Wilson & Witkowski, 2003	BT vs D	individual	Afrotropical	1	359
Williams <i>et al.</i> , 2007	BT vs D	individual	Afrotropical	6	187
Midgley <i>et al.</i> , 2011	BT vs D	individual	Afrotropical	8	24
Higgins <i>et al.</i> , 2012	BT vs D	individual	Afrotropical	14	350
Skowno <i>et al.</i> , 1999	H vs D	individual	Afrotropical	1	143
Shackleton <i>et al.</i> , 2002	H vs D	individual	Afrotropical	1	114
Botha <i>et al.</i> , 2004	H vs D	mean	Afrotropical	2	2
Assogbadjio <i>et al.</i> , 2006	H vs D	mean	Afrotropical	1	1
Baufour & Midgley, 2006	H vs D	mean	Afrotropical	1	1
Levick & Rogers, 2008	H vs D	individual	Afrotropical	6	566
Kakaï & Sinsin, 2009	H vs D	individual	Afrotropical	1	463
Dayamba <i>et al.</i> , 2011	H vs D	mean	Afrotropical	6	6
Midgley <i>et al.</i> , 2011	H vs D	individual	Afrotropical	1	66
Moncrief <i>et al.</i> , 2011	H vs D	individual	Afrotropical	2	563
Higgins <i>et al.</i> , 2012	H vs D	individual	Afrotropical	14	347
Hoffmann <i>et al.</i> , 2003	BT vs D	individual	Neotropical	10	117
Hoffmann & Solbrig, 2003	BT vs D	individual	Neotropical	3	87
This study	BT vs D	individual	Neotropical	55	526
García-Nuñez <i>et al.</i> , 2001	H vs D	individual	Neotropical	3	313
Zhang <i>et al.</i> , 2009	H vs D	individual	Neotropical	1	48
Bernasol & Lima-Ribeiro, 2010	H vs D	individual	Neotropical	4	411
Souza, 2010	H vs D	individual	Neotropical	6	298
Costa <i>et al.</i> , 2012	H vs D	individual	Neotropical	1	36
This study	H vs D	individual	Neotropical	55	526

Table S3 Available information on the study sites provided in the articles from which the data was extracted. P: mean annual precipitation (mm); T: mean annual temperature (°C)

Reference	Study site	P	T
Assogbadjio et al. 2006	Benin	900-1200	24-31
Baufour and Midgley 2006	Greenhouse experiment (savanna plants)	-	-
Dayamba et al. 2011	Burkina Faso and Sudan	857-860	16-40
Kakaï and Sinsin 2009	Wari–Maro Forest Reserve, Benin	1052	-
Levick and Rogers 2008	Kruger National Park, South Africa	-	-
Higgins et al. 2012	Kruger National Park, South Africa	447-737	-
Midgley et al. 2011	Cape Peninsula and Moutain, South Africa	-	-
Moncrief et al. 2011	Kruger National Park, South Africa	-	-
Nygaard and Elfving 2000	Burkina Faso, Sudan	620–785	28
Shackleton et al. 2002	Bushbuckridge Nature Reserve, South Africa	850-1000	-
Skowno et al. 1999	Hluhluwe Game Reserve, South Africa	671-910	11.5-25.9
Williams et al. 2007	South Africa (three provinces)	-	-
Wilson and Witkowski 2003	Nylsvley Provincial Nature Reserve, South Africa	630	19
Hoffmann et al. 2003	Federal district, Brazil	1500	-
Hoffmann and Solbrig 2003	Federal district, Brazil	-	-
Bernasol and Lima-Ribeiro 2010	Goiás, Brazil	1500	25
Costa et al. 2012	Minas Gerais, Brazil	-	-
García-Nuñez et al. 2001	Barinas, Venezuela	1500	27
Souza 2010	Federal District, Brazil	1469	21.9
Zhang et al. 2009	Federal District Brazil	1500	19-23
This study	Goias, Brazil	1000-2000	24.6

Table S4 List of the species used in this study and the respective references from which the data was extracted

Ecozone	Family	Species	Authorship	Reference
Afrotropical	Anacardiaceae	<i>Lannea acida</i>	A.Rich.	Nygaard & Elfving, 2000
		<i>Lannea microcarpa</i>	Engl.	Nygaard & Elfving, 2000
		<i>Rhus chirindensis</i>	Baker f.	Williams <i>et al.</i> , 2007
		<i>Sclerocarya birrea</i>	(A. Rich.) Hochst.	Nygaard & Elfving, 2000; Higgins <i>et al.</i> , 2012
	Arecaceae	<i>Hyphaene coriacea</i>	Gaertn.	Levick & Rogers, 2008
	Burseraceae	<i>Boswellia dalzielii</i>	Hutch.	Nygaard & Elfving, 2000
		<i>Commiphora africana</i>	(A.Rich.) Endl.	Nygaard & Elfving, 2000
	Canellaceae	<i>Warburgia salutaris</i>	(G.Bertol.) Chiov.	Williams <i>et al.</i> , 2007
		<i>Catha edulis</i>	(Vahl) Endl.	Botha <i>et al.</i> , 2004
		<i>Elaeodendron transvaalense</i>	R.H.Archer	Williams <i>et al.</i> , 2007
		<i>Maytenus senegalensis</i>	(Lam.) Exell	Higgins <i>et al.</i> , 2012
	Combretaceae	<i>Anogeissus leiocarpus</i>	(DC.) Guill. & Perr.	Nygaard & Elfving, 2000
		<i>Combretum apiculatum</i>	Sond.	Higgins <i>et al.</i> , 2012
		<i>Combretum collinum</i>	Fresen.	Higgins <i>et al.</i> , 2012
		<i>Combretum fragrans</i>	F. Hoffm.	Nygaard & Elfving, 2000
		<i>Combretum glutinosum</i>	Perr. ex DC.	Nygaard & Elfving, 2000
		<i>Combretum hereroense</i>	Schinz	Higgins <i>et al.</i> , 2012
		<i>Combretum imberbe</i>	Wawra	Higgins <i>et al.</i> , 2012
		<i>Combretum micranthum</i>	G.Don	Nygaard & Elfving, 2000
		<i>Combretum nigricans</i>	Lepr. ex Guill. & Perr.	Nygaard & Elfving, 2000
<i>Combretum zeyheri</i>		Sond.	Higgins <i>et al.</i> , 2012	
	<i>Guiera senegalensis</i>	J.F.Gmel.	Nygaard & Elfving, 2000	

	<i>Terminalia avicennioides</i>	Guill. & Perr.	Nygard & Elfving, 2000
	<i>Terminalia sericea</i>	Burch. ex DC.	Higgins <i>et al.</i> , 2012
Ebenaceae	<i>Euclea</i> ssp.	L.	Skowno <i>et al.</i> , 1999
Fabaceae	<i>Acacia ataxacantha</i>	DC.	Nygard & Elfving, 2000
	<i>Acacia chariensis</i>	A. Chev.	Higgins <i>et al.</i> , 2012
	<i>Acacia dudgeon</i>	Holland	Nygard & Elfving, 2000
	<i>Acacia gourmaensis</i>	A.Chev.	Nygard & Elfving, 2000
	<i>Acacia karroo</i>	Hayne	Baufour & Midgley, 2006
	<i>Acacia macrostachya</i>	DC.	Nygard & Elfving, 2000
	<i>Acacia nigrescens</i>	Oliv.	Moncrieff <i>et al.</i> , 2011
	<i>Acacia pennata</i>	(L.) Willd.	Nygard & Elfving, 2000
	<i>Acacia Senegal</i>	(L.) Willd.	Nygard & Elfving, 2000
	<i>Acacia seyal</i>	Delile	Nygard & Elfving, 2000
	<i>Acacia xanthophloea</i>	Benth.	Williams <i>et al.</i> , 2007
	<i>Albizia adianthifolia</i>	(Schum.) W.Wight	Williams <i>et al.</i> , 2007
	<i>Albizia chevalieri</i>	Harms	Nygard & Elfving, 2000
	<i>Albizia harveyi</i>	E.Fourn.	Levick & Rogers, 2008
	<i>Burkea Africana</i>	Hook.	Wilson & Witkowski, 2003
	<i>Cassia sieberiana</i>	DC.	Nygard & Elfving, 2000
	<i>Colophospermum mopane</i>	(Benth.) Leonard	Levick & Rogers, 2008; Moncrief <i>et al.</i> , 2011 Nygard & Elfving, 2000; Levick & Rogers, 2008
	<i>Dalbergia melanoxydon</i>	Guill. & Perr.	Nygard & Elfving, 2000
	<i>Detarium microcarpum</i>	Guill. & Perr.	Nygard & Elfving, 2000; Levick & Rogers, 2008, Higgins <i>et al.</i> , 2012
	<i>Dichrostachys cinerea</i>	(L.) Wight & Arn.	Nygard & Elfving, 2000
	<i>Entada Africana</i>	Guill. & Perr.	

	<i>Isoberlinia</i> ssp.	Craib & Stapf ex Holland	Kakaï & Sinsin, 2009
	<i>Lonchocarpus capassa</i>	Rolfe	Higgins <i>et al.</i> , 2012
	<i>Peltophorum africanum</i>	Sond.	Higgins <i>et al.</i> , 2012
	<i>Philenoptera violacea</i>	(Klotzsch) Schrire	Levick & Rogers, 2008
	<i>Piliostigma reticulatum</i>	(DC.) Hochst.	Nygaard & Elfving, 2000
	<i>Piliostigma thonningii</i>	(Schumach.) Milne-Redh.	Nygaard & Elfving, 2000
	<i>Prosopis Africana</i>	(Guill. & Perr.) Taub.	Nygaard & Elfving, 2000
	<i>Pterocarpus angolensis</i>	DC.	Shackleton <i>et al.</i> , 2002
	<i>Pterocarpus erinaceus</i>	Poir.	Nygaard & Elfving, 2000
	<i>Pterocarpus lucens</i>	Guill. & Perr.	Nygaard & Elfving, 2000
	<i>Tamarindus indica</i>	L.	Nygaard & Elfving, 2000
Loganiaceae	<i>Strychnos madagascariensis</i>	Poir.	Higgins <i>et al.</i> , 2012
	<i>Strychnos spinosa</i>	Lam.	Nygaard & Elfving, 2000
Malvaceae	<i>Bombax costatum</i>	Pellegr. & Vuillet	Nygaard & Elfving, 2000
	<i>Grewia baillonii</i>	R.Vig.	Nygaard & Elfving, 2000; Higgins <i>et al.</i> , 2012
	<i>Grewia flavescens</i>	Juss.	Nygaard & Elfving, 2000
	<i>Grewia mollis</i>	Juss.	Nygaard & Elfving, 2000
	<i>Sterculia setigera</i>	Delile	Nygaard & Elfving, 2000
Olacaceae	<i>Ximenia americana</i>	L.	Nygaard & Elfving, 2000
Phyllanthaceae	<i>Flueggea virosa</i>	(Roxb. ex Willd.) Royle	Nygaard & Elfving, 2000
Primulaceae	<i>Rapanea melanophloeos</i>	(L.) Mez	Botha <i>et al.</i> , 2004
Proteaceae	<i>Leucadendron argenteum</i>	(L.) R. Br.	Midgley <i>et al.</i> , 2011
	<i>Leucadendron conocarpodendron</i>	L.	Midgley <i>et al.</i> , 2011
	<i>Leucadendron laureolum</i>	Fourc.	Midgley <i>et al.</i> , 2011

		<i>Mimetes fimbriifolius</i>	Salisb. ex Knight	Midgley <i>et al.</i> , 2011
		<i>Protea coronate</i>	Lam.	Midgley <i>et al.</i> , 2011
		<i>Protea lepidocarpodendron</i>	L.	Midgley <i>et al.</i> , 2011
		<i>Protea nitida</i>	Mill.	Midgley <i>et al.</i> , 2011
		<i>Protea repens</i>	L.	Midgley <i>et al.</i> , 2011
Rubiaceae		<i>Crossopteryx febrifuga</i>	(Afzel. ex G.Don) Benth.	Nygard & Elfving, 2000
		<i>Feretia apodanthera</i>	Delile	Nygard & Elfving, 2000
Sapotaceae		<i>Butyrospermum paradoxum</i>	(C.F. Gaertn.) Hepper	Nygard & Elfving, 2000
Zygophyllaceae		<i>Balanites aegyptiaca</i>	(L.) Delile	Nygard & Elfving, 2000
		<i>Balanites maughamii</i>	Sprague	Williams <i>et al.</i> , 2007
Neotropical	Apocynaceae	<i>Aspidosperma tomentosum</i>	Mart.	This study; Hoffmann <i>et al.</i> , 2003
		<i>Hancornia speciosa</i>	Gomes	This study
	Araliaceae	<i>Didymopanax macrocarpus</i>	(Cham. & Schtdl.) Seem.	Hoffmann <i>et al.</i> , 2003
		<i>Didymopanax malmei</i>	Harms	This study
		<i>Eremanthus erythropappus</i>	(DC.) MacLeish	This study
	Asteraceae	<i>Piptocarpha rotundifolia</i>	(Less.) Baker (Silva Manso) Benth. &	This study; Hoffmann & Solbrig, 2003; Bernasol & Lima-Ribeiro, 2010
	Bignoniaceae	<i>Tabebuia aurea</i>	Hook.f. ex S.Moore	This study
		<i>Tabebuia ochracea</i>	A.H. Gentry	This study
	Calophyllaceae	<i>Kielmeyera coriacea</i>	Mart. & Zucc.	This study
	Caryocaraceae	<i>Caryocar brasiliense</i>	A.St.-Hil.	This study
	Celastraceae	<i>Plenckia populnea</i>	Reissek	This study
		<i>Salacia multiflora</i>	(Lam.) DC.	Hoffmann <i>et al.</i> , 2003
	Connaraceae	<i>Connarus suberosus</i>	Planch.	This study

	<i>Rourea induta</i>	Planch.	This study; Hoffmann & Solbrig, 2003; Souza, 2010
Dilleniaceae	<i>Curatella Americana</i>	L.	Bernasol & Lima-Ribeiro, 2010
	<i>Davilla elliptica</i>	A.St.-Hil.	This study
Ebenaceae	<i>Diospyros hispida</i>	A.DC.	This study
	<i>Diospyrus burquelli</i>	NA	Souza, 2010
Erythroxylaceae	<i>Erythroxylum campestre</i>	A.St.-Hil.	This study
	<i>Erythroxylum suberosum</i>	A.St.-Hil.	This study
	<i>Erythroxylum tortuosum</i>	Mart.	This study
Fabaceae	<i>Acosmium dasycarpum</i>	(Vogel) Yakovlev	This study
	<i>Albizia niopoides</i>	(Benth.) Burkart	This study
	<i>Anadenanthera peregrina</i>	(L.) Speg.	This study
	<i>Bowdichia virgilioides</i>	Kunth	García-Nuñez <i>et al.</i> , 2001
	<i>Copaifera langsdorffii</i>	Desf.	Costa <i>et al.</i> , 2012
	<i>Dimorphandra mollis</i>	Benth.	This study
	<i>Diptychandra aurantiaca</i>	Tul.	This study
	<i>Hymenaea stigonocarpa</i>	Hayne	This study, Hoffmann <i>et al.</i> , 2003
	<i>Machaerium acutifolium</i>	Vogel	This study
	<i>Mimosa amnis-atri</i>	Barneby	This study
	<i>Sclerolobium aureum</i>	(Tul.) Baill.	This study
	<i>Sclerolobium paniculatum</i>	Vogel	Zhang <i>et al.</i> , 2009
	<i>Stryphnodendron adstringens</i>	(Mart.) Coville	This study
Lythraceae	<i>Lafoensia pacari</i>	A. St.-Hil.	This study
Malpighiaceae	<i>Byrsonima basiloba</i>	A.Juss.	This study
	<i>Byrsonima coccolobifolia</i>	Kunth	This study

	<i>Byrsonima crassa</i>	Nied.	Hoffmann <i>et al.</i> , 2003
	<i>Byrsonima crassifolia</i>	(L.) Kunth	García-Núñez <i>et al.</i> , 2001
	<i>Byrsonima verbascifolia</i>	(L.) Rich. ex Juss.	This study
Malvaceae	<i>Eriotheca gracilipes</i>	(K.Schum.) A.Robyns (Mart. & Zucc.) Schott & Endl.	This study
	<i>Eriotheca pubescens</i>		This study
Melastomataceae	<i>Miconia albicans</i>	(Sw.) Steud.	This study
	<i>Miconia ferruginata</i>	DC.	Souza 2010
	<i>Miconia pohliana</i>	Cogn.	Hoffmann <i>et al.</i> , 2003
	<i>Mouriri elliptica</i>	Mart.	This study
Myrtaceae	<i>Eugenia aurata</i>	O.Berg	This study
	<i>Eugenia bimarginata</i>	DC.	This study
	<i>Eugenia puniceifolia</i>	(Kunth) DC.	This study
	<i>Myrcia amapensis</i>	McVaugh	This study
	<i>Myrcia bella</i>	Cambess.	This study
	<i>Myrcia crassifolia</i>	(Miq.) Kiaersk.	This study
	<i>Myrcia guianensis</i>	(Aubl.) DC.	This study
	<i>Myrcia lasiantha</i>	DC.	This study
	<i>Psidium laruotteanum</i>	Cambess.	This study
Nyctaginaceae	<i>Guapira noxia</i>	(Netto) Lundell	This study; Hoffmann <i>et al.</i> , 2003
Ochnaceae	<i>Ouratea acuminata</i>	(DC.) Engl.	This study
	<i>Ouratea hexasperma</i>	(A. St.-Hil.) Baill.	Souza 2010; Hoffmann <i>et al.</i> , 2003
	<i>Ouratea spectabilis</i>	(Mart. ex Engl.) Engl.	This study
Primulaceae	<i>Myrsine guianensis</i>	(Aubl.) Kuntze	Hoffmann <i>et al.</i> , 2003
Proteaceae	<i>Roupala Montana</i>	Aubl.	This study; Hoffmann & Solbrig, 2003

Rubiaceae	<i>Palicourea rígida</i>	Kunth	This study; Gracia-Nuñez <i>et al.</i> , 2001
Salicaceae	<i>Casearia sylvestris</i>	Sw.	This study
Sapotaceae	<i>Pouteria ramiflora</i>	(Mart.) Radlk.	This study
	<i>Pouteria torta</i>	(Mart.) Radlk.	This study
Solanaceae	<i>Solanum lycocarpum</i>	A. St.-Hil.	This study
Styracaceae	<i>Styrax ferrugineus</i>	Nees & Mart.	This study
Symplocaceae	<i>Symplocos rhamnifolia</i>	A. DC.	Souza, 2010
Vochysiaceae	<i>Qualea grandiflora</i>	Mart.	Bernasol & Lima-Ribeiro, 2010
	<i>Qualea multiflora</i>	Mart.	Bernasol & Lima-Ribeiro, 2010
	<i>Qualea parviflora</i>	Mart.	This study
	<i>Vochysia thyrsoidea</i>	Pohl	Hoffmann <i>et al.</i> , 2003

Table S5: Summary of the GLMM analyses testing the differences in the relationship of bark thickness and stem height against diameter between ecozones (afrotropical vs neotropical; see Fig. 3), including interaction (diameter x ecozone), for the whole data set (the same analysis but restricted to overlapping range sizes is provided in Table 2 of the main text). Species were considered as random factors. Degree of freedom (Df), AIC, and the likelihood ratio test (LR) are presented. For each model, the rightmost column provides the estimated parameters for the fixed effects of the final significant model

	Df	AIC	LR	<i>P</i>	Estimate
<i>a) Bark thickness</i>					1.35 [intercept]
log(diam)	4	-392.09			0.55 · log(diam)
+ Ecozone (E)	5	-434.41	44.32	< 0.0001	0 [Afrotr], 0.56 [Neotr]
+ log(diam) x E	6	-462.09	29.69	< 0.0001	0.25 · log(diam) [Neotr]
<i>c) Height</i>					1.15 [intercept]
log(diam)	4	-1297.86			0.62 · log(diam)
+ Ecozone (E)	5	-1317.83	21.97	< 0.0001	0 [Afrotr], -0.03 [Neotr]
+ log(diam) x E	6	-1353.65	37.82	< 0.0001	0.13 · log(diam) [Neotr]

Table S6: Shared families and the numbers of species within them for each trait (Bark thickness or height vs. diameter) and ecoregion (afrotropical and neotropical)

Trait	Shared families	Species number	
		afrotropical	neotropical
Bark thickness vs. Diameter	Fabaceae	25	10
	Sapotaceae	1	2
	Malvaceae	6	2
	Proteaceae	9	1
Height vs. Diameter	Ebenaceae	1	2
	Fabaceae	13	13
	Malvaceae	1	2
	Proteaceae	8	1

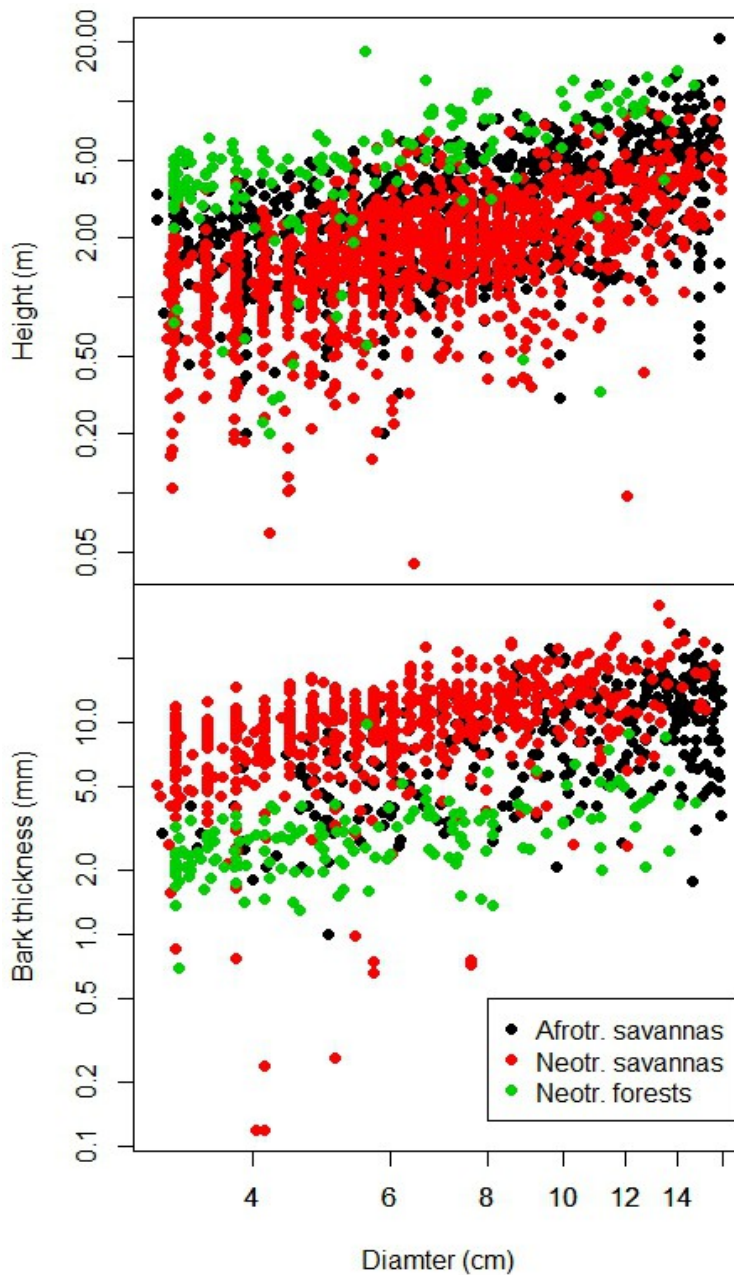


Fig. S1 Height (in m; top) and bark thickness (in mm; bottom) in relation to stem diameter (in cm) for Afrotropical savanna (black symbols), Neotropical savanna (red symbols) and Neotropical closed-forest (green symbols) trees. Axes are presented in log-scale. Only the range of diameters where the tree datasets overlapped were considered. Trees from Neotropical forests are taller and with thinner bark than trees from Neotropical and Afrotropical savannas (Height in Neotropical forest vs Afrotropical savannas: LR= 9.9, $p= 0.0017$; Height in Afrotropical savannas vs Neotropical savannas: LR= 19.2, $p<0.0001$; Bark in Neotropical forest vs Afrotropical savannas: LR= 16.3, $p= 0.0001$; Bark in Afrotropical savannas vs Neotropical savannas: LR= 49.7, $p<0.0001$).

References for Table S1-S4

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