Table 1. Summary of observed variation in thermally-relevant leaf traits with canopy height and/or between sun and shade leaves

trait	symbol	units	response	forest type(s)	reference(s)
Leaf anatomy and morphological traits					
leaf mass per area (or inverse of specific leaf area)	LMA (or $1/SLA$)	$g \cdot cm^{-2}$	↑ with height	TeB, TrB, BoN	Coble and Cavaleri 2014, Mau et al. 2018, Sack et al. 2006, Chin and Sillett 2019
			↑ with light	TeB, TrB, BoN	Coble and Cavaleri 2014, Mau et al. 2018, Sack et al. 2006, Wyka et al. 2012
leaf density	$density$	$g \cdot cm^{-3}$	↑ with height	TeB	Coble and Cavaleri 2014
			↑ with light	TeB, TrB	Coble and Cavaleri 2014, Marques et al. 2000
			≈ with light	BoN	Wyka et al. 2012
leaf area	LA	cm^2	↓ with height	TeB, TrB, BoN	Kusi and Karasi 2020, Cavaleri et al. 2010, Kenzo et al. 2016, Gebauer et al. 2015
			↓ with light	TrB, TeB, BoN	Kusi and Karasi, 2020, Sack et al. 2006, Gebauer et al. 2015
stomatal density	$D_{stomata}$	mm^{-2}	↑ with height	TrB, TeB, BoN	Marenco et al. 2017, Kafuti et al. 2020, Van Wittenberghe et al. 2012, Sack et al. 2006, Chin and Silette 2017
			↑ with light	TeB, TrB	Sack et al. 2006, Kafuti et al. 2020, Marenco et al. 2017
length of minor veins/unit area	VLA_{min}	$mm \cdot mm^{-2}$	↑ with height	TeB	Zhang et al. 2019
			↑ with light	TeB	Zhang et al. 2019
leaf thickness	$LeaThi$	μm	↑ with height	TrB, TeB, BoN	Weerasinghe et al. 2014,Coble and Cavaleri 2014, Van Wittenberghe et al. 2012, Oldham et al. 2010, Marenco et al. 2017
			↑ with light	TeB, BoN, TrB	Coble and Cavaleri 2014, Wyka et al. 2012, Marenco et al. 2016, Weerasinghe et al. 2014
trichome density	$trichome$	mm^{-2}	↑ with height	TrB	Ichie et al. 2016
			↑ with light	TeB, TrB	Gregoriou et al. 2007, Ichie et al. 2016, Levizou et al. 2005, Liakoura 1997
blade inclination angle (vertical)	ϕB	∘	↑ with height	TeB, TrB	Niinemets et al. 1998, Ishida et al. 1998, Fauset et al. 2018
			↑ with light	TeB, TrB	Millen and Clendon 1979, Ishida et al. 1998, Niinemets et al. 1998, Fauset et al. 2018
pinnate lobation	$lobation$	cm^2	↑ with height	TeB	Sack et al. 2006
			↓ with height	TeB	Kusi and Karasi, 2020
			↑ with light	TeB	Kusi and Karasi 2020, Sack et al. 2006
drip tip length	$driptip$	cm	↓ with height	TrB	Panditharathna et al. 2008
			↓ with light	TrB	Panditharatna et al. 2008
upper cuticle thickness	CT	μm	↑ with height	TrB, BoN	Panditharathna et al. 2008, Chin and Sillett 2019
			↑ with light	TrB, TeB	Panditharathna et al. 2008, Marques et al. 2000, Baltzer and Thomas 2005
adaxial leaf wettability (as drop contact angle)	DCA_{ad}	∘	↑ with height	TeB	Van Wittenberghe et al. 2012
	$durationofsurfacewetness$	%	↓ with height	TrB	Dietz et al. 2007
	DCA	∘	↑ with light	TeB	Van Wittenberghe et al. 2012
			↑ with height	TrB, TeB, BoN	Kenzo et al. 2015, Coble et al. 2016, Scartazza et al. 2016, Duursma and Marshall, 2006, Harley et al. 1996
Leaf biochemical and physiological traits					

Table 1. Summary of observed variation in thermally-relevant leaf traits with canopy height and/or between sun and shade leaves *(continued)*

trait	symbol	units	response	forest type(s)	reference(s)
Nitrogen per leaf area	N_a	$g \cdot m^{-2}$	≈↑ with light	TrB, TeB, BoN	Weerasinghe et al. 2014, Hernandez et al. 2020, Scartazza et al. 2016, Coble et al. 2016, Harley et al. 1996, Duursma and Marshall, 2006.
			≈↓ with height	TrB, TeB, BoN	Weerasinghe et al. 2014, Kenzo et al. 2015, Coble et al. 2016, Scartazza et al. 2016, Harley et al. 1996, Turnbull et al. 2003
Nitrogen per leaf mass	N_m	$mg \cdot g^{-1}$	≈↓ with light	TrB, TeB, BoN	Chen et al. 2020, Kenzo et al. 2015, Coble et al. 2016, Scartazza et al. 2016, Harley et al. 1996, Wyka et al. 2012
			↑ with height	TrB, TeB, BoN	Weerasinghe et al. 2014,van de Weg et al. 2012, M.A Cavaleri et al. 2008, Mau et al. 2018
Phosphorous per leaf area	P_a	$g \cdot m^{-2}$	↑ with light	TrB, Te, BoN	Weerasinghe et al. 2014, Wyka et al. 2012
			≈↓ with height	TrB	Weerasinghe et al. 2014, Chen et al. 2020, Mau et al. 2018
Phosphorous per leaf mass	P_m	$mg \cdot g^{-1}$	≈ with light	TrB, TeB	Weerasinghe et al. 2014, Chen et al. 2020, Mau et al. 2018
			↑ with height	TrB, TeB	Koniger et al. 1995, Scartazza et al. 2016, Niinemets et al. 1998
xanthophyll cycle pigments	VAZ	μmolm^{-2}	↑ with light	TeB, TrB	Scartazza et al. 2016, Mastubara et al. 2009
			↓ with height	TrB, TeB	Harris and Medina 2013, Hansen et al. 2001
chlorophyll content	chl	$mg \cdot cm^{-2}$	↓ with light	TrB, TeB	Marques et al. 2000, Poorter et al. 1995, Hansen et al. 2001
			↑ with height	TeB, TrB	Scartazza et al. 2016, Poorter et al. 1995
b carotene and lutein	$bcarotene$ and $lutein$	μmolm^{-2}	↑ with light	TeB, TrB	Scartazza et al. 2016, Koniger et al. 1995
			↑ with height	TeB, TrB	Scartazza et al. 2016, Poorter et al. 1995
chlorophyll a/b ratio	$chla/b$	$mol \cdot mol^{-1}$	↑ with light	TeB, TrB	Scartazza et al. 2016, Poorter et al. 1995, Matsubara et al. 2009, Niinemets et al. 1998
			↑ with height	BoN, TeB, TrB	Duursma and Marshall, 2006, Coble et al. 2017, Kenzo et al. 2015
carbon isotope composition	$\delta^{13}C$	‰	↑ with light	BoN, TeB, TrB	Duursma and Marshall, 2006, Coble et al. 2016, Kenzo et al. 2015
			↓ with height	TeB	Scartazza et al. 2016
intercellular C_{O_2} concentration	C_i	μmol $\cdot mol^{-1}$	↓ with light	TeB	Scartazza et al. 2016
			≈ with height	TrB	Poorter et al. 1995, 2000
PAR absorptance	ABS	% nm	≈↑ with light	TrB	Poorter et al. 1995, 2000
			↓ with height	TrB	Poorter et al. 1995, 2000
absorptance efficiency per unit biomass	ABS	$\% \cdot g^{-1}$	↓ with light	TrB	Poorter et al. 1995, 2000
			↓ with height	TrB	Poorter et al. 1995, 2000
PAR transmittance	$transmittance$	%	↓ with light	TrB	Poorter et al. 1995, 2000
			≈ with height	TrB	Poorter et al. 1995, 2000
reflectance	$reflectance$	%	≈ with light	TrB	Poorter et al. 1995, 2000

*composite climatic stress variable from canopy temperature, vapour pressure deficit, and relative humidity is higher in lower canopy