

SUPPORTING INFORMATION

Variations and determinants of carbon content in plants: a global synthesis

Suhui Ma¹, Feng He², Di Tian³, Dongting Zou¹, Zhengbing Yan¹, Yulong Yang⁴,
Tiancheng Zhou⁴, Kaiyue Huang⁴, Haihua Shen⁵, Jingyun Fang^{1*}

¹ *Department of Ecology, College of Urban and Environmental Sciences, Peking University, Beijing 100871, China;*

² *College of Life Sciences, University of Chinese Academy of Sciences, Beijing 100049, China;*

³ *College of Life Sciences, Capital Normal University, Beijing 100048, China;*

⁴ *College of Earth and Environmental Sciences, Lanzhou University, Lanzhou 730000, China;*

⁵ *State Key Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China*

**Corresponding author: Dr. Jingyun Fang*

Email: jyfang@urban.pku.edu.cn

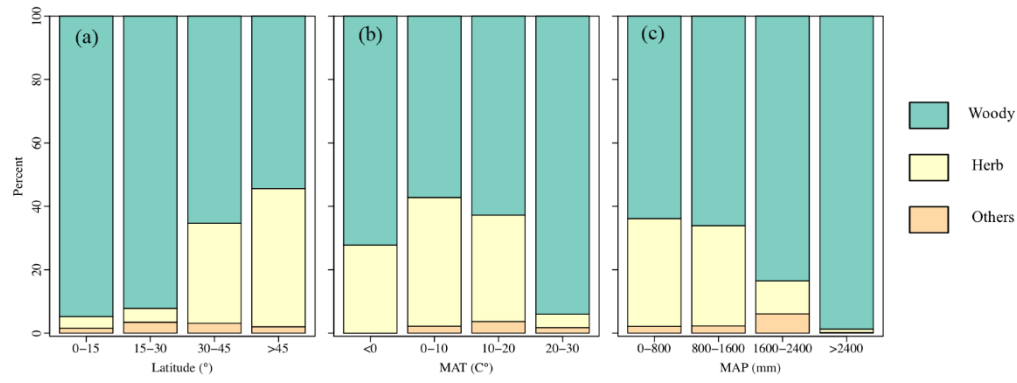
This file includes:

Figure S1

Table S1-S6

Appendix 1

20 **Figure S1.** Changes in the species composition along the gradients of latitude, mean annual
 21 temperature (MAT) and mean annual precipitation (MAP). The percentage of woody plants
 22 decreased with the increasing latitude and with the decreasing MAT and MAP. Herb showed the
 23 opposite trends with woody plants. Other life forms showed no significant change along latitudinal
 24 and climatic gradients.



28 **Table S1.** Data sets in TRY that contributed to our global dataset of plant carbon content.
 29 References cited in this table are attached below.

DatasetID	Contributor	Dataset Name	Reference
10	Joseph Craine	Roots Of the World (ROW) Database	Craine et al., 2005
34	Jon Lloyd	The RAINFOR Plant Trait Database	Fyllas et al., 2009
50	Bill Shipley	Leaf and Whole Plant Traits Database	Unpublished
52	Hiroko Kurokawa	Traits of Bornean Trees Database	Kurokawa and Nakashizu, 2008
70	Peter Reich	Cedar Creek Savanna SLA, C, N Database	Willis et al., 2010
77	Enio Sosinski	FAPESP Brazil Rainforest Database	Unpublished
84	Nadejda Soudzilovskaia	Causasus Plant Traits Database	Unpublished
87	Ülo Niinemets	Global Leaf Robustness and Physiology Database	Niinemets, 2001
101	Dennis Baldocchi	Photosynthesis Traits Database	Xu and Baldocchi, 2003
114	Josep Penuelas	Hawaiian Leaf Traits Database	Penuelas et al., 2010
125	Benjamin Yguel	Quercus Leaf C&N Database	Yguel et al., 2011
131	Josep Penuelas	Catalonian Mediterranean Shrubland Trait Database	Unpublished

152	Peter Adler	Functional Traits of Graminoids in Semi-Arid Steppes Database	Adler et al., 2004
167	Franciska De Vries	Leaf N-Retention Database	Unpublished
170	Cedric Frenette-Dussault	Plant Functional Traits of Arid Steppes in Eastern Morocco (ECWP-Morocco)	Frenette - Dussault et al., 2012
172	Katrin Fleischer	Leaf Characteristics of <i>Pinus Sylvestris</i> and <i>Picea Abies</i>	Unpublished
193	Daniel Laughlin	Plant Traits for <i>Pinus</i> and <i>Juniperus</i> Forests in Arizona	Laughlin et al., 2010; 2011
223	Gerhard Zotz	San Lorenzo Epiphyte Leaf Traits Database	Unpublished
227	Bruno Cerabolini	Leaf Structure and Economic Spectrum	Pierce et al., 2013
228	Bruno Cerabolini	Flora d'Italia Functional Traits Hoard(FIFTH)	Cerabolini et al., 2010
229	Bruno Cerabolini	Hydrophytes Traits Database	Pierce et al., 2012
230	Dylan Craven	Panama Tree Traits	Craven et al., 2007
231	Tomas Domingues	TROBIT West Africa	Domingues et al., 2010
236	Sandy Harrison	Chinese Traits	Prentice et al., 2011
252	Bill Shipley	Leaf Structure and Chemistry	Auger and Shipley, 2013
255	Tomas Domingues	LBA ECO Tapajos: Leaf Characteristics and Photosynthesis	Domingues et al., 2007

256	Marko Spasojevic	Niwot Alpine Plant Traits	Spasojevic and Suding, 2012
262	Mathew Williams	LBA-ECO CD-09 Soil and Vegetation Characteristics, Tapajos National Forest, Brazil	Williams et al., 2012
263	Jennifer Powers	Costa Rican Tropical Dry Forest Trees	Powers and Tiffin, 2010
269	Christopher Baraloto	The Bridge Database	Baraloto et al., 2010

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Table S2. Model summary for the ordinary least squares (OLS) regression of plant carbon content on three factors (Latitude, MAT and MAP). Abbreviations: MAT, mean annual temperature; MAP, mean annual precipitation.

Factor	Organ	<i>n</i>	<i>r</i> ²	<i>p</i>
Latitude	Reproductive organ	107	0.02	0.147
Latitude	Root	1800	0.05	<0.001
Latitude	Leaf	17036	0.05	<0.001
Latitude	Stem	3352	0.00	0.053
MAT	Reproductive organ	99	0.02	0.125
MAT	Root	1785	0.04	<0.001
MAT	Leaf	17409	0.04	<0.001
MAT	Stem	3327	0.01	<0.001
MAP	Reproductive organ	99	0.07	0.009
MAP	Root	1785	0.03	<0.001
MAP	Leaf	17409	0.09	<0.001
MAP	Stem	3327	0.00	0.421

37 **Table S3.** The summary of anova (Type III tests) for plant C content in reproductive organs.
 38 Climatic factor includes mean annul temperature (MAT) and mean annual precipitation (MAP).

Factor	Sum Sq	Df	F value	P value
Intercept	4771	1	366.48	< 0.001
MAT	6	1	0.46	0.50
MAP	8	1	0.61	0.44
Life form	3	2	0.10	0.91
MAT: MAP	85	1	6.66	0.01
MAT: Life form	9	1	0.65	0.42
MAP: Life form	29	1	2.25	0.14
MAT: MAP: Life form	2	1	0.14	0.71
Residuals	1172	90		

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41 **Table S4.** The summary of anova (Type III tests) for plant C content in roots. Climate factor
 42 contains mean annul temperature (MAT) and mean annual precipitation (MAP).

Factor	Sum Sq	Df	F value	P value
Intercept	5831	1	359.17	< 0.001
MAT	2	1	0.12	0.73
MAP	4	1	0.27	0.60
Life form	256	3	5.25	<0.01
MAT: MAP	5	1	0.28	0.59
MAT: Life form	328	3	6.73	< 0.001
MAP: Life form	73	3	1.49	0.21
MAT: MAP: Life form	424	3	0.87	0.46
Residuals	28717	1769		

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45 **Table S5.** The summary of anova (Type III tests) for plant C content in leaves. Climate factor
 46 contains mean annul temperature (MAT) and mean annual precipitation (MAP).

Factor	Sum Sq	Df	F value	P value
Intercept	6517	1	510.08	< 0.001
MAT	22	1	1.72	0.19
MAP	39	1	3.09	0.08
Life form	2829	3	73.81	< 0.001
MAT: MAP	13	1	1.00	0.32
MAT: Life form	371	3	9.68	< 0.001
MAP: Life form	818	3	21.34	< 0.001
MAT: MAP: Life form	471	3	12.29	< 0.001
Residuals	222234	17393		

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49 **Table S6.** The summary of anova (Type III tests) for plant C content in stems. Climate factor
 50 contains mean annul temperature (MAT) and mean annual precipitation (MAP).

Factor	Sum Sq	Df	F value	P value
Intercept	83	1	7.75	0.01
MAT	104	1	9.72	<0.01
MAP	108	1	10.11	<0.01
Life form	286	3	8.92	< 0.001
MAT: MAP	107	1	10.03	<0.01
MAT: Life form	129	3	4.02	0.01
MAP: Life form	136	3	4.25	0.01
MAT: MAP: Life form	108	3	3.36	0.02
Residuals	35321	3311		

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Appendix 1. 24 References are form global plant carbon content dataset and the other are collected from three databases including Google Scholar (<https://scholar.google.com/>), Web of Science (<http://isiknowledge.com>) and CNKI (<http://www.cnki.net/>).

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