

Supplementary materials

Using the plant functional traits to define the biomass energy potential of invasive alien plant species

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Table S1: List of the 63 IAPS and traits data selected for this study (the 10 IAPS selected for biomass analysis are highlighted). Legend: Neotrop. = Neotropical, (x) = commercial hybrid, Tcomp = thermal competitive, Tcons = thermal conservative, Bacqu = Biochemical acquisitive, Bcomp = Biochemical competitive.

Species	Range of distribution	growth form	bioenergy use type	C:N	GHV (KJ Kg ⁻¹)	LA (mm ²)	SLA (mm ² mg ⁻¹)	LDMC (%)	LNC (%)	H (mm)	SM (mg)	PC1-economics	PC2-size	C (%)	S (%)	R (%)
<i>Acer negundo</i>	America North	woody	Tcomp	19.8	19506.6	8241.4	27.0	25.4	2.5	12500	28.0	0.0	0.9	50.3	23.7	25.9
<i>Ailanthus altissima</i>	Asia	woody	Tcomp	20.2	19315.8	64503.0	12.9	35.5	2.4	10000	29.2	0.0	1.2	75.0	21.2	3.7
<i>Ambrosia artemisiifolia</i>	America North	herbs	Bcomp	11.8	18446.0	3802	20	22	3.8	766	3.6	0.7	0.1	49.5	23.2	27.2
<i>Amelanchier lamarckii</i>	America North	woody	Tcomp	22.7	18417.7	2900.5	36.3	34.3	2.0	5500	18.3	-0.3	0.2	28.1	38.8	33.1
<i>Amorpha fruticosa</i>	America North	woody	Bcomp	9.8	20200.8	5235.7	25.2	31.0	5.0	2500	7.8	1.2	0.9	40.4	34.8	24.8
<i>Artemisia verlotiorum</i>	Asia East	herbs	Tcons	26.1	18022.0	2761.5	13.2	36.5	1.7	1250	1.1	-0.8	-0.5	35.4	54.8	9.8
<i>Asclepias syriaca</i>	America North	herbs	Bcomp	13.9	17291.4	16255.3	15.6	21.7	3.1	1250	6.2	0.5	0.2	72.5	15.0	12.5
<i>Azolla filiculoides</i>	America Neotr.	herbs	Bacqu	10.0	15246.2	0.9	41.4	29.5	3.5	55	0.1	0.2	-2.9	0.0	44.6	55.4
<i>Bidens frondosa</i>	America North	herbs	Bcomp	13.5	19248.0	3465.1	36.4	17.8	3.5	1620	4.9	0.7	0.3	45.6	6.0	48.4
<i>Broussonetia papyrifera</i>	Asia East	woody	Bcomp	13.6	17936.4	12770.9	21.0	25.8	3.2	3500	2.1	0.6	0.4	59.9	23.7	16.4
<i>Buddleja davidii</i>	Asia	woody	Tcons	38.5	20625.2	4268.7	11.9	30.2	1.3	2500	0.1	-1.4	-0.3	48.6	44.6	6.8
<i>Catalpa bignonioides</i>	America North	woody	Tcomp	20.3	18319.2	23200.3	12.1	33.2	2.3	6500	24.4	-0.2	0.7	66.8	29.5	3.7
<i>Cinnamomum glanduliferum</i>	Asia	woody	Tcons	56.6	19172.2	2667.5	8.5	47.5	0.9	11250	172.0	-2.1	0.3	31.5	68.5	0.0
<i>Cortaderia selloana</i>	America South	herbs	Tcons	28.7	17844.5	10117.2	6.1	33.5	1.6	1750	4.7	-1.0	-0.1	59.6	40.4	0.0
<i>Crataegus submollis</i>	America North	woody	Tcomp	23.4	19924.3	6156.1	21.9	32.4	2.1	6000	84.7	-0.3	0.8	42.9	36.5	20.6
<i>Elaeagnus pungens</i>	Asia East	woody	Tcomp	17.0	20286.7	2488.4	13.5	33.1	2.9	2000	16.0	0.0	0.6	36.4	51.7	11.8
<i>Elaeagnus umbellata</i>	Asia	woody	Tcomp	18.7	19644.5	1974.5	8.1	40.0	2.6	6000	19.3	-0.4	0.6	32.3	67.7	0.0
<i>Elodea canadensis</i>	America North	herbs	Bacqu	8.7	16301.7	26.3	76.4	17.5	4.5	325	0.0	1.0	-1.8	0.2	4.7	95.1
<i>Elodea densa</i>	America South	herbs	Bacqu	8.5	17623.9	104.0	92.6	14.1	5.1	500	0.0	1.3	-1.2	5.1	0.0	94.9
<i>Elodea nuttallii</i>	America North	herbs	Bacqu	11.4	15859.7	27.7	62.3	22.5	3.3	375	0.0	0.4	-2.0	0.3	26.4	73.3
<i>Helianthus tuberosus</i>	America North	herbs	Tcomp	21.5	16847.4	10553.1	14.2	20.2	1.9	1500	3.8	-0.4	-0.2	73.7	13.8	12.5
<i>Heteranthera reniformis</i>	America Neotr.	herbs	Bacqu	7.5	18011.8	1542.7	64.4	10.6	5.8	115	0.0	1.7	-0.9	30.0	0.0	70.0
<i>Humulus scandens</i>	Asia West	herbs	Bcomp	10.1	16463.8	17677.2	18.9	16.5	4.0	2000	18.0	1.0	0.4	82.2	0.0	17.8
<i>Impatiens balfourii</i>	Asia	herbs	Bcomp	13.4	17223.7	4661.9	50.4	10.0	3.2	920	3.7	0.7	-0.2	47.0	0.0	53.0
<i>Impatiens glandulifera</i>	Asia	herbs	Bcomp	11.2	16959.6	8776.6	45.4	11.6	3.7	1500	9.8	1.1	0.2	57.0	0.0	43.0
<i>Impatiens parviflora</i>	Asia East	herbs	Bcomp	9.2	18760.3	4549.2	94.4	10.1	5.0	728	8.0	1.6	0.3	39.1	0.0	60.9

<i>Lagarosiphon major</i>	Africa	herbs	Bacqu	13.6	16582.1	17.6	46.2	24.4	3.0	350	0.0	0.1	-2.0	0.0	34.4	65.6
<i>Lemna minuta</i>	tropical (Euroasia, Africa, America)	herbs	Bacqu	13.1	15121.9	2.4	155.5	10.1	2.7	2	0.0	0.3	-3.8	0.0	0.0	100.0
<i>Ligustrum lucidum</i>	Asia East	woody	Tcons	34.8	20295.6	3841.3	7.2	37.6	1.4	5500	31.0	-1.3	0.5	42.8	57.2	0.0
<i>Ligustrum ovalifolium</i>	Asia East	woody	Tcons	28.5	19662.4	1301.7	13.4	29.0	1.7	1500	21.0	-0.9	0.0	32.6	55.8	11.6
<i>Ligustrum sinense</i>	Asia East	woody	Tcomp	22.6	20328.7	667.1	14.3	34.0	2.2	4500	17.0	-0.6	0.3	20.0	64.3	15.7
<i>Lonicera japonica</i>	Asia East	woody	Tcons	31.8	20418.5	2413.5	15.0	33.9	1.6	3500	1.8	-1.0	0.0	34.1	51.4	14.6
<i>Ludwigia hexapetala</i>	America	herbs	Bcomp	11.7	17693.5	1324.3	28.9	18.4	3.7	487.5	2.9	0.7	-0.3	35.3	10.7	53.9
<i>Myriophyllum aquaticum</i>	America South	herbs	Bacqu	12.6	16010.3	455.1	203.2	6.8	3.0	500	1.2	0.9	-1.2	11.2	0.0	88.8
<i>Nelumbo nucifera</i>	tropical (Africa and Asia)	herbs	Bcomp	13.8	17970.5	324706.8	17.2	17.3	3.2	1500	1.8	0.9	0.8	92.3	1.0	6.7
<i>Nymphaea marliacea</i>	Eurasia and America (x)	herbs	Tcomp	18.9	18136.5	43936.7	13.9	17.4	2.4	1100	2.5	0.1	0.3	91.4	2.5	6.1
<i>Parthenocissus quinquefolia</i>	America North	woody	Bcomp	15.3	20314.5	21116.3	26.4	22.3	3.3	3500	25.2	0.6	1.1	66.4	13.3	20.3
<i>Paulownia tomentosa</i>	Asia East	woody	Tcomp	17.0	18406.1	47907.0	17.4	25.8	2.7	8000	0.2	0.3	0.4	76.6	14.6	8.9
<i>Phyllostachys reticulata</i>	Asia West	woody	Tcons	33.1	17033.9	3191.6	12.4	54.3	1.3	9000	7.6	-1.3	-0.3	29.2	64.9	5.9
<i>Phyllostachys viridiglaucescens</i>	Asia East	woody	Tcons	31.1	17685.1	3024.5	15.8	45.9	1.4	9000	4.8	-1.1	-0.2	29.8	57.5	12.6
<i>Pinus nigra</i>	Europe (North-East)	woody	Tcons	116.1	20823.1	167.3	5.4	21.4	0.5	8000	26.3	-3.8	-0.6	4.5	95.5	0.0
<i>Pinus rigida</i>	America North	woody	Tcons	40.6	19144.5	456.6	5.2	40.3	1.2	14250	8.0	-2.0	-0.1	15.7	84.3	0.0
<i>Pinus strobus</i>	America North	woody	Tcons	33.1	18844.6	78.5	8.9	47.9	1.4	19000	17.0	-1.7	-0.3	3.7	96.3	0.0
<i>Prunus serotina</i>	America North	woody	Tcomp	18.3	19038.0	2079.8	15.4	40.7	2.6	8500	100.6	-0.2	0.7	28.2	58.9	12.9
<i>Pseudosasa japonica</i>	Asia West	woody	Tcomp	19.8	17474.4	6698.5	14.6	49.6	2.2	3500	4.0	-0.3	0.0	38.6	52.5	8.9
<i>Pueraria lobata</i>	Asia East	herbs	Bcomp	13.0	20205.6	26015.6	26.8	29.0	3.8	4500	12.3	0.9	1.2	62.0	20.5	17.5
<i>Quercus rubra</i>	America North	woody	Tcomp	21.3	19232.7	6309.9	12.1	44.2	2.3	17500	3143.0	-0.4	1.4	42.2	52.6	5.2
<i>Reynoutria bohemica</i>	Asia East (x)	herbs	Bcomp	16.6	17595.8	35492.7	31.7	16.6	2.6	1750	2.5	0.5	0.2	78.3	0.0	21.7
<i>Reynoutria japonica</i>	Asia West	herbs	Tcomp	21.2	19091.7	9609.9	18.7	25.9	2.3	1800	2.1	-0.2	0.2	57.2	25.5	17.4
<i>Robinia pseudoacacia</i>	America North	woody	Bcomp	12.6	19101.8	11289.3	17.8	32.6	3.7	8500	19.2	0.7	1.0	53.2	33.1	13.7
<i>Robinia viscosa</i>	America North	woody	Tcomp	16.4	19062.5	9818.8	16.1	36.3	2.9	18000	25.5	0.2	1.0	49.8	38.8	11.4
<i>Rosa multiflora</i>	Asia East	woody	Bcomp	15.0	18667.1	7690.0	30.1	31.1	3.1	1500	8.4	0.5	0.3	43.6	30.2	26.2
<i>Rubus phoenicolasius</i>	Asia East	woody	Tcomp	20.8	18002.7	9970.6	27.7	26.7	2.2	2500	3.3	-0.1	0.0	51.7	23.3	25.0
<i>Sagittaria latifolia</i>	America North	herbs	Bcomp	11.6	17136.2	28176.2	19.5	11.1	3.6	600	0.6	0.9	0.0	84.5	0.0	15.5
<i>Saururus cernuus</i>	America North	herbs	Bcomp	8.8	17927.0	13295.5	53.2	11.0	4.9	600	0.7	1.6	0.1	60.0	0.0	40.0
<i>Senecio inaequidens</i>	Africa	herbs	Bacqu	13.3	15863.5	156.3	16.6	15.2	2.9	630	0.3	0.0	-1.4	25.3	0.0	74.7
<i>Sicyos angulatus</i>	America North	herbs	Bcomp	13.8	17792.0	20152.5	80.6	10.0	3.2	3500	102.2	1.0	0.7	59.6	0.0	40.4
<i>Solidago canadensis</i>	America North	herbs	Tcomp	15.8	18158.0	1292.7	14.1	34.8	2.8	1150	0.1	0.0	-0.6	26.6	59.2	14.1
<i>Solidago gigantea</i>	America North	herbs	Tcomp	14.7	17939.2	1553.7	13.8	31.1	3.0	1024	0.2	0.1	-0.5	32.2	55.1	12.8
<i>Sorbaria sorbifolia</i>	Asia	woody	Bcomp	18.8	21454.9	36192.6	26.5	31.6	2.8	2000	50.3	0.4	1.3	64.2	20.5	15.3
<i>Spiraea japonica</i>	Asia West	woody	Tcomp	19.3	20358.9	3052.5	35.7	31.4	2.6	1000	0.0	0.1	-0.4	30.3	35.4	34.4
<i>Taxodium distichum</i>	America North	woody	Tcons	30.4	19261.9	23.3	14.1	38.0	1.6	20000	87.0	-1.5	-0.2	0.0	82.4	17.6
<i>Trachycarpus fortunei</i>	Asia East	woody	Tcomp	24.0	20050.8	776815.9	6.4	44.6	2.2	8500	181.3	-0.2	2.0	77.9	22.1	0.0

Table S2: Mean and standard error (se) of the aboveground biomass indicators (C:N and GHV) calculated on leaves and entire aboveground biomass and PC1-economics, PC2-size, C, S and R of the ten selected IAPS.

Species	CN.biomass		GHV.biomass (KJ Kg ⁻¹)		CN.leaves		GHV.leaves (KJ Kg ⁻¹)		PC1-economics	PC2-size	C (%)	S (%)	R (%)
	mean	se	mean	se	mean	mean	mean	mean	mean	mean	mean	mean	mean
<i>Ailanthus altissima</i>	145.6	9.2	20888.8	417.7	20.2	19315.8	0.0	1.2	75.0	21.2	3.7		
<i>Artemisia verlotiorum</i>	37.2	2.4	17177.4	88.4	26.1	18022.0	-0.8	-0.5	35.4	54.8	9.8		
<i>Buddleja davidii</i>	231.7	37.6	18971.6	46.1	38.5	20625.2	-1.4	-0.3	48.6	44.6	6.8		
<i>Ludwigia hexapetala</i>	25.6	2.1	16644.7	45.1	11.7	17693.5	0.7	-0.3	35.3	10.7	53.9		
<i>Prunus serotina</i>	271.5	26.8	18891.0	86.5	18.3	19038.0	-0.2	0.7	28.2	58.9	12.9		
<i>Pueraria lobata</i>	19.3	0.8	16956.9	61.5	13.0	20205.6	0.9	1.2	62.0	20.5	17.5		
<i>Quercus rubra</i>	412.0	39.1	18824.7	136.4	21.3	19232.7	-0.4	1.4	42.2	52.6	5.2		
<i>Reynoutria japonica</i>	20.9	1.1	17417.9	73.8	21.2	19091.7	-0.2	0.2	57.2	25.5	17.4		
<i>Solidago gigantea</i>	29.8	1.7	17747.3	80.3	14.7	17939.2	0.1	-0.5	32.2	55.1	12.8		
<i>Trachycarpus fortunei</i>	61.1	3.6	18258.5	56.7	24.0	20050.8	-0.2	2.0	77.9	22.1	0.0		