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Supplementary Material

Does plant flammability differ between leaf and litter bed scale? Role of fuel characteristics and consequences for flammability assessment

Anne Ganteaume

Irstea, UR RECOVER-EMR, CS 40061, F-13182 Aix-en-Provence, France. Email: anne.ganteaume@irstea.fr

Table S1. Leaf flammability variables and characteristics of the 15 species studied ($n = 50$ for each species; averages are in bold and s.e. in parentheses)

Abbreviations: TTI, time-to-ignition; FD, flaming duration; IF, ignition frequency; FMC, fuel moisture content; Sctc, contact surface area; Stot, total surface area; Thi, thickness; W, weight; V, volume; SVR, surface area to volume ratio; D, density; SLA, specific leaf area; Co, *Cotoneaster franchetii*; CuA, *Cupressus arizonica*; CuL, *Cupressocyparis leylandii*; CuS, *Cupressus sempervirens*; El, *Elaeagnus ebbingei*; Eu, *Euonymus japonicus*; Li, *Ligustrum japonicum*; Ne, *Nerium oleander*; Pho, *Photinia fraseri*; Phy, *Phyllostachys* sp.; Pi, *Pittosporum tobira*; Pr, *Prunus laurocerasus*; Py, *Pyracantha coccinea*; Th, *Thuja occidentalis*; Vt, *Viburnum tinus*

	TTI (s)	FD (s)	IF (%)	FMC (%)	S_ctc (cm ²)	S_tot (cm ²)	Thi (cm)	W (g)	V (cm ³)	SVR (cm ⁻¹)	D (g cm ⁻³)	SLA (cm ² g ⁻¹)
Co	8.02 (4.15)	17.64 (3.18)	100	72	2.37 (1.08)	4.73 (2.17)	0.027 (0.003)	0.05 (0.02)	0.06 (0.04)	73.10 (7.02)	0.77 (0.15)	47.32 (4.87)
CuA	32.71 (4.85)	5.00 (3.19)	61	117	17.79 (11.05)	49.63 (30.81)	0.093 (0.001)	1.63 (0.95)	1.30 (0.79)	38.24 (0.94)	1.25 (0.08)	10.93 (0.74)
CuL	33.16 (6.75)	8.18 (3.56)	100	150	22.98 (17.79)	57.17 (44.50)	0.090 (0.001)	1.41 (1.19)	1.42 (1.07)	40.35 (1.89)	0.99 (0.11)	16.30 (1.71)
CuS	35.55 (4.05)	6.51 (6.32)	94	150	17.71 (7.96)	30.36 (13.25)	0.075 (0.001)	0.42 (0.08)	0.34 (0.12)	90.44 (4.93)	1.25 (0.96)	42.17 (4.84)
El	16.39 (6.61)	11.88 (2.72)	98	127	25.75 (7.34)	51.50 (14.69)	0.033 (0.003)	0.69 (0.25)	0.86 (0.30)	59.72 (5.27)	0.80 (0.03)	37.32 (3.43)
Eu	17.51 (5.40)	9.55 (3.75)	98	155	13.61 (1.94)	27.23 (3.88)	0.044 (0.01)	0.55 (0.16)	0.61 (0.22)	44.46 (9.55)	0.90 (0.08)	24.75 (5.19)
Li	21.38 (3.55)	7.71 (3.64)	42	213	19.11 (4.00)	38.22 (7.99)	0.035 (0.007)	0.63 (0.21)	0.67 (0.22)	56.82 (14.39)	0.94 (0.07)	30.34 (9.00)
Ne	23.67 (4.27)	8.14 (2.04)	86	213	23.44 (2.52)	46.88 (5.04)	0.044 (0.006)	0.96 (0.19)	1.03 (0.22)	45.54 (7.21)	0.93 (0.08)	24.42 (3.80)
Pho	14.96 (6.81)	8.26 (4.20)	100	92	25.07 (2.32)	50.14 (4.63)	0.038 (0.002)	0.76 (0.20)	0.95 (0.13)	53.06 (3.43)	0.80 (0.24)	32.99 (16.98)
Phy	10.71 (2.09)	8.75 (3.13)	96	117	20.33 (1.81)	40.67 (3.63)	0.022 (0.031)	0.44 (0.02)	0.45 (0.31)	90.36 (8.13)	0.98 (0.26)	46.20 (4.61)
Pi	29.57 (11.73)	8.96 (6.80)	46	178	13.23 (1.58)	26.46 (3.16)	0.032 (0.002)	0.44 (0.05)	0.43 (0.05)	62.04 (4.21)	1.03 (0.05)	30.07 (2.24)
Pr	17.43 (5.70)	4.92 (4.99)	98	178	46.63 (7.50)	93.26 (15.01)	0.042 (0.003)	1.68 (0.27)	1.97 (0.41)	47.23 (3.47)	0.85 (0.08)	27.76 (1.95)
Py	15.86 (4.02)	7.11 (3.41)	88	108	4.32 (0.49)	8.64 (0.99)	0.016 (0.004)	0.07 (0.01)	0.07 (0.01)	125.53 (23.64)	1.02 (0.04)	61.69 (12.02)
Th	17.37 (8.26)	9.36 (4.26)	92	109	10.33 (9.28)	24.36 (3.94)	0.070 (0.001)	0.58 (0.56)	0.41 (0.40)	59.41 (0.90)	1.41 (0.09)	17.81 (1.18)
Vt	7.78 (2.84)	6.64 (2.21)	96	163	20.33 (6.87)	40.67 (13.74)	0.022 (0.004)	0.44 (0.17)	0.46 (0.19)	89.26 (15.35)	0.97 (0.05)	46.22 (7.20)

Table S3. Litter flammability variables and characteristics of the 15 species studied ($n = 30$ for each species; averages are in bold and s.e. are in parentheses)

Abbreviations: IF, ignition frequency; TTI, time-to-ignition; FD, flaming duration; FS, flame spread; %Ev, proportion of evergreen leaves; %Sca, proportion of scale-leaves; %Fp, proportion of fine particles; %Cp, proportion of coarse particles; %Fd, proportion of fine debris; %Cd, proportion of coarse debris; %NC, proportion of non-combustible particles; BD, litter bulk density. Co, *Cotoneaster franchetii*; CuA, *Cupressus arizonica*; CuL, *Cupressocyparis leylandii*; CuS, *Cupressus sempervirens*; El, *Elaeagnus ebbingei*; Eu, *Euonymus japonicus*; Li, *Ligustrum japonicum*; Ne, *Nerium oleander*; Pho, *Photinia fraseri*; Phy, *Phyllostachys* sp.; Pi, *Pittosporum tobira*; Pr, *Prunus laurocerasus*; Py, *Pyracantha coccinea*; Th, *Thuja occidentalis*; Vt, *Viburnum tinus*

Sp	IF (%)	TTI (s)	FD (s)	FS (0 to 4)	%Ev	%Sca	%Fp	%Cp	%Fd	%Cd	%NC	BD (kg m ⁻³)
Co	77	96.31 (3326)	78.83 (33.28)	2.78 (0.51)	61.70 (12.90)	0	27.00 (21.91)	4.50 (5.20)	0	1.35 (2.69)	0	31.26 (6.01)
CuA	97	85.68 (92.14)	250.06 (151.54)	2.71 (1.44)	0	23.1 (9.40)	3.04 (1.61)	5.50 (7.70)	55.89 (11.80)	3.8 (5.30)	0.50 (0.70)	209.08 (111.29)
CuL	100	101.73 (85.03)	274.73 (113.85)	3.30 (1.15)	0	4.20 (1.50)	4.40 (1.20)	1.00 (0.40)	70.80 (25.40)	12.30 (8.90)	8.30 (11.30)	151.70 (13.70)
CuS	90	92.12 (53.14)	147.91 (32.79)	2.36 (1.12)	0	36.07 (26.56)	28.26 (16.00)	0.20 (0.39)	33.18 (27.22)	2.37 (3.55)	14.78 (22.26)	243.10 (129.74)
El	57	70.71 (79.61)	145.12 (107.25)	3.47 (1.29)	91.81 (6.61)	0	2.56 (2.04)	1.27 (2.04)	0	2.72 (1.37)	1.64 (2.99)	34.11 (11.89)
Eu	33	132.43 (37.88)	71.67 (83.57)	1.52 (1.01)	74.6 (19.80)	0	14.80 (8.70)	0	0	0	16.1 (8.40)	23.65 (1.97)
Li	60	46.72 (60.74)	86.00 (58.42)	3.72 (1.33)	26.41 (10.82)	0	6.63 (13.99)	3.95 (4.04)	20.90 (3.08)	23.55 (21.88)	15.55 (0.84)	56.08 (26.81)
Ne	57	49.26 (109.32)	66.89 (36.89)	3.10 (0.74)	73.82 (15.54)	0	11.07 (7.14)	0	1.44 (2.47)	0.80 (1.16)	15.86 (10.92)	37.72 (13.18)
Pho	100	97.20 (36.42)	108.23 (22.86)	4.00 (1.24)	48.55 (14.76)	0	4.27 (1.41)	0	28.36 (9.79)	7.87 (3.14)	10.95 (14.05)	38.67 (13.49)
Phy	68	56.24 (59.91)	66.09 (34.49)	3.43 (0.00)	8.63 (3.95)	0	5.27 (1.62)	1.86 (1.53)	58.01 (8.92)	17.51 (2.97)	2.98 (2.43)	34.59 (5.35)
Pi	20	116.85 (113.50)	55.00 (45.96)	2.54 (1.71)	65.68 (15.38)	0	20.79 (19.49)	5.19 (9.87)	2.44 (4.10)	2.65 (3.23)	2.60 (3.82)	42.09 (26.35)
Pr	83	153.39 (132.14)	75.33 (81.79)	3.50 (1.02)	63.37 (19.73)	0	6.76 (7.89)	0	6.63 (4.71)	14.55 (14.11)	9.78 (9.61)	27.48 (9.74)
Py	93	188.32 (50.00)	145.32 (100.97)	2.58 (1.06)	26.35 (14.31)	0	34.32 (36.40)	3.01 (2.59)	33.70 (18.04)	4.22 (2.29)	17.37 (12.37)	49.30 (93.67)

Th	67	63.09 (50.77)	90.86 (54.51)	0.43 (0.75)	0	0.90 (0.20)	2.80 (1.90)	2.80 (8.10)	74.80 (13.00)	8.70 (3.30)	11.10 (6.70)	222.40 (37.77)
Vt	93	73.65 (78.48)	86.29 (33.23)	3.56 (0.70)	36.00 (16.50)	0	18.90 (22.30)	3.30 (5.70)	21.60 (21.55)	18.20 (14.00)	1.50 (2.30)	12.38 (5.25)

Table S5. Significant relationships (correlation coefficients, *R* and *P*-values) obtained between leaf and litter characteristics (bold, all species; italic, excluding Cupressaceae spp.)

Abbreviations: FMC, fuel moisture content; Sctc, leaf contact surface area; Stot, leaf total surface area; Thi, leaf thickness; W, leaf weight; V, leaf volume; SVR, leaf surface area to volume ratio; SLA, specific leaf area; D, leaf density; %Ev, proportion of evergreen leaves; %Sca, proportion of scale-leaves; %Fp, proportion of fine particles; %Cp, proportion of coarse particles; %Fd, proportion of fine debris; %Cd, proportion of coarse debris; %NC, proportion of non-combustible particles; BD litter bulk density; NS, not significant

	%Ev	%Sca	%Cp	%Cd	%Fp	%Fd	%NC	BD
FMC	NS	NS	NS	NS	NS	NS	NS	NS
Sctc	NS	NS	-0.53; <i>P</i> = 0.0402	NS	-0.56; <i>P</i> = 0.0315	NS	NS	NS
Stot	NS	NS	<i>-0.61; <i>P</i> = 0.0469</i>	NS	-0.65; <i>P</i> = 0.0089	NS	NS	NS
Thi	-0.55; <i>P</i> = 0.034	0.64; <i>P</i> = 0.0094	<i>-0.61; <i>P</i> = 0.0479</i>	NS	NS	0.57; <i>P</i> = 0.0272	NS	0.86; <i>P</i> < 0.0001
W	NS	NS	<i>-0.65; <i>P</i> = 0.0317</i>	NS	-0.66; <i>P</i> = 0.0077	NS	NS	NS
V	NS	NS	<i>-0.67; <i>P</i> = 0.0242</i>	NS	-0.65; <i>P</i> = 0.0089	NS	NS	NS
SVR	<i>-0.64; <i>P</i> = 0.0332</i>	NS	NS	NS	0.71; <i>P</i> = 0.0031	<i>0.61; <i>P</i> = 0.046</i>	NS	NS
SLA	NS	NS	NS	NS	0.70; <i>P</i> = 0.0040	NS	NS	NS
D	-0.73; <i>P</i> = 0.0019	0.57; <i>P</i> = 0.0252	NS	NS	NS	0.67; <i>P</i> = 0.0057	NS	0.86; <i>P</i> < 0.0001

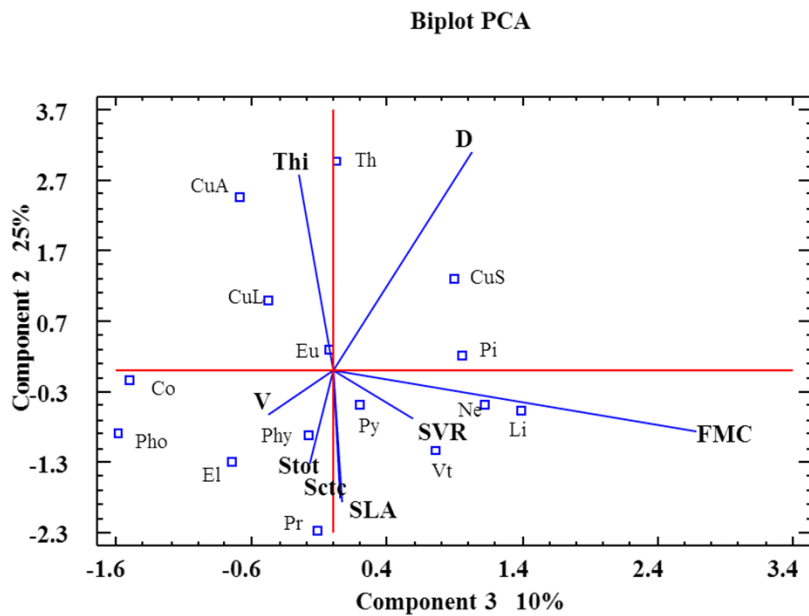
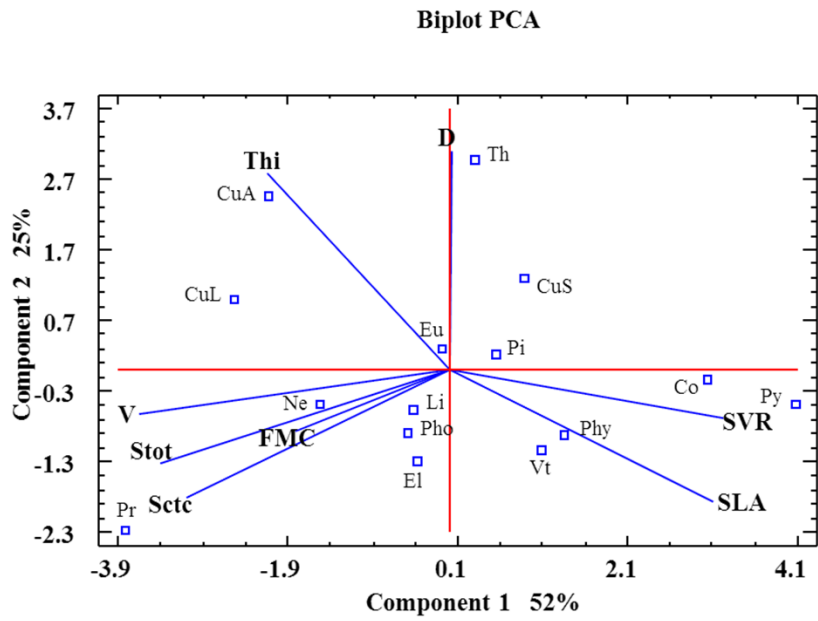


Fig. S1. Biplots of the principal component analysis showing relationships between leaf characteristics among the 15 ornamental species. Abbreviations: Sctc, leaf contact surface area; Stot, leaf total surface area; Thi, leaf thickness; V, leaf volume; SVR, leaf surface area-to-volume ratio; SLA, specific leaf area; D, leaf density; Co, *Cotoneaster franchetii*; CuA, *Cupressus arizonica*; CuL, *Cupressocyparis leylandii*; CuS, *Cupressus sempervirens*; El, *Elaeagnus ebbingei*; Eu, *Euonymus japonicus*; Li, *Ligustrum japonicum*; Ne, *Nerium oleander*; Pho, *Photinia fraseri*; Phy, *Phyllostachys* sp.; Pi, *Pittosporum tobira*; Pr, *Prunus laurocerasus*; Py, *Pyracantha coccinea*; Th, *Thuja occidentalis*; Vt, *Viburnum tinus*.

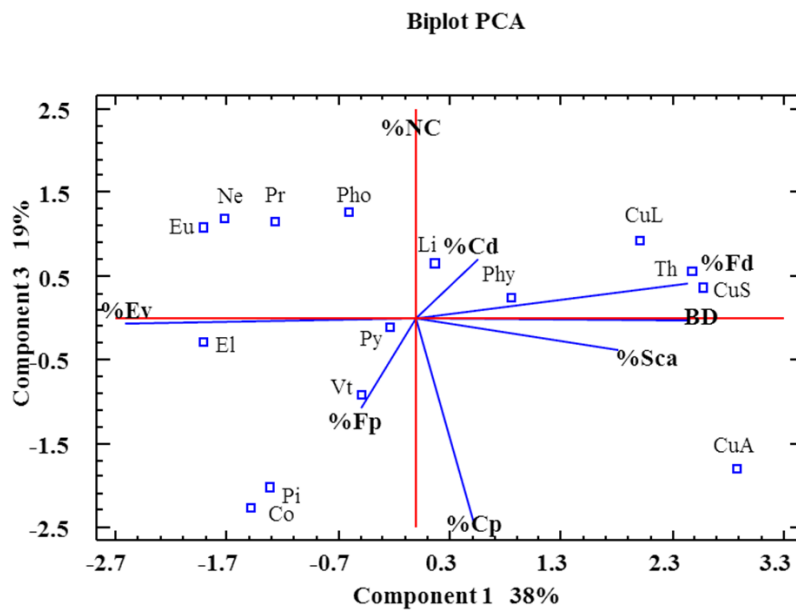
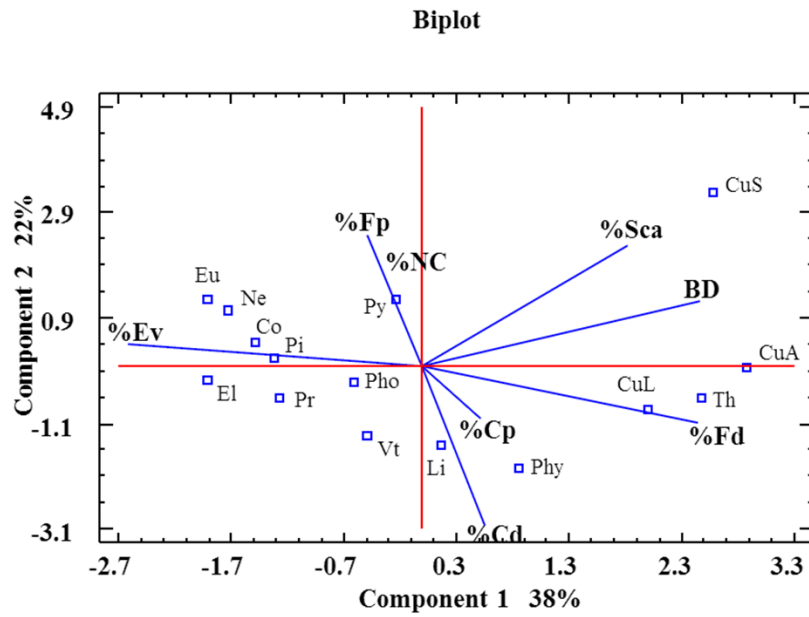


Fig. S2. Biplots of the principal component analysis showing relationships between litter characteristics among the 15 ornamental species. Abbreviations: %Ev, proportion of evergreen leaves; %Sca, proportion of scale-leaves; %Fp, proportion of fine particles; %Cp, proportion of coarse particles; %Fd, proportion of fine debris; %Cd, proportion of coarse debris; %NC, proportion of non-combustible particles; Co, *Cotoneaster franchetii*; CuA, *Cupressus arizonica*; CuL, *Cupressocyparis leylandii*; CuS, *Cupressus sempervirens*; El, *Elaeagnus ebbingei*; Eu, *Euonymus japonicus*; Li, *Ligustrum japonicum*; Ne, *Nerium oleander*; Pho, *Photinia fraseri*; Phy, *Phyllostachys* sp.; Pi, *Pittosporum tobira*; Pr, *Prunus laurocerasus*; Py, *Pyracantha coccinea*; Th, *Thuja occidentalis*; Vt, *Viburnum tinus*