Supplementary material for

Invasive Glossy Buckthorn (*Frangula alnus*) Has Weak Impact on Native Understory Plant and Saprophagous Macroarthropod Communities

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Table S1. Statistical output of redundancy analysis (RDA) of environmental variables (standardized) associated with understory plants specific community (Hellinger transformation) between all 43 plots in our study site, at L'Assomption.

Variable	Variance	F	Pr(>F)
F. alnus density	0.02388	2.1635	**<0.05 ***
Canopy cover (%)	0.03567	3.2321	**<0.005****
Humidity (%)	0.03567	2.1371	**<0.05 ***
pH	0.01343	1.2169	0.238761
Model **R^2ajusted = 0,1016**	0.09656	2.1874	**<0.001*****

Table S2. Statistical outputs of redundancy analysis (RDA) of constraint variables (standardized) that may be associated with specific variation in shredder detritivores communities (logarithmic transformation) between 43 sampling plots in study site, at L'Assomption.

Variable	**Variance**	**F**	**Pr(>F)**
F. alnus density (per m^{-2})	0.776	2.655	**<0.05***
F.alnus in litter biomass (%)	0.227	0.777	0.555
Effective number of plant species	0.377	1.289	0.272
Humidity (%)	1.806	6.175	**<0.001*****
Woody debris cover (%)	0.752	2.571	**<0.05***
pH	0.292	0.998	0.396
Litter biomass (gm^{-2})	0.276	0.945	0.443
Model **R^2ajusted: 0.1668077**	10.2365		**< 0.001*****

Other environmental variables were tested as explicative variables on the effective number of species of understory plants and only leaf litter biomass showed to have an effect (Table S5). Indeed, leaf litter biomass, which is composed of leaves of all plants and trees per plot, seems to negatively impact the understory plants' diversity in addition to *F. alnus* density (R^2 = 0.2219). Nevertheless, explained variation percentage remains generally low (Table S5) and no other measured environmental conditions expressed any relationship with the plant index. Moreover, we observe that along the density gradient of *Frangula alnus*, no variation was observed in total leaf litter biomass. We therefore didn't investigate on these results as they seemed to be not relevant and not our primary focus.

Table S3. The most explanatory multiple linear regressions models of the variation in the effective number of species of understory plants with several explanatory variables (*F. alnus* density, Litter biomass, pH). These models are derived by comparing several models and choosing those whose AICc are the lowest based on the MuMin package in R [1].

Model's formula	**X variables**	Estimate	T value	Std error	Pr(>|t|)	R^2
Effective number of species ~ F. alnus density + biomass litter	*F. alnus* density	-0.706767	-2.762	0.255913	**<0.01 ****	
	Litter biomass	*-0.009453*	*-2.107*	0.004487	**<0.05 ***	**0.2219**
Effective number plants ~ F. alnus density + biomass litter + pH	*F.alnus* density	-0.807277	-2.959	0.272835	**<0.01 ****	
	Litter biomass	-0.008940	-1.984	0.004507	**0.054.**	**0.224**
	Mean pH	-0.824501	-1.052	0.783514	0.153	

Table S4. Linear regressions models using *Frangula alnus* ratio in leaf litter and effective number of native understory plant species as predictive variables on different diversity index of saprophagous macroarthropods.

		Descriptive statistics		Linear models				
Dependent variable	Independent variable	Mean ± SE	Median (Min-Max)	Estimate	SE	T-value	*p-value*	R^2
Species richness[1]	*F. alnus* in leaf litter (%) Mean = 4.46 SE = 0.775	4.47 ± 0.13	5 (2-6)	-0.018	0.026	-0.686	0.497	0.011
Effective number of species		2.59 ± 0.11	2.49 (1.24-4.14)	-0.029	0.022	-1.317	0.195	0.041
Shannon-Wiener index (H′)		0.91 ± 0.04	0.914 (0.26-1.42)	-0.011	0.009	-1.270	0.211	0.038
Evenness index (J′)		0.60 ± 0.02	0.612 (0.216-0.881)	-0.007	0.005	-1.537	0.132	0.055
Total abundance[2]		20.39 ± 1.8	20.3 (4.3-52.6)	-0.026	0.039	-0.670	0.507	0.011
Effective number of species	Effective number of plants species Mean= 7.07 SE = 0.3279	2.59 ± 0.11	2.49 (1.24-4.14)	0.07452	0.062	1.206	0.235	0.034
Total abundance[2]		20.39 ± 1.8	20.3 (4.3-52.6)	0.02116	0.095	0.223	0.824	0.001

Table S5. Linear regressions of density of *F. alnus* (per m²), *F. alnus* in leaf litter (%) and effective number of plant species as predictive variables on five diversity index of saprophagous macroarthropods species. Abundance of detritivores have been transformed (square roots) to fit linear model conditions. All arthropods' data are based on the average of three collects within summer 2020.

Species richness 10

Total abundance : 2566

	Descriptive statistics				Linear models				
Variable Y	Mean ± SE	Median	Min	Max	Estimate	Std error	T-value	Pr(>|t|)	R^2
***F. alnus* density (> 1m height) per m² Mean = 1.31 ; SE = 0.176**									
Species richness[1]	4.47 ± 0.13	5	2	6	-0.27995	0.1070	-2.616	**<0.02***	0.1431
Effective number of species[1]	2.59 ± 0.11	2.49	1.24	4.14	-0.19505	0.09306	-2.096	**<0.05***	0.100
Shannon-Wiener index (H')	0.91 ± 0.04	0.914	0.216	1.420	-0.09680	0.03677	-2.633 7	**<0.02***	0.1446
Evenness index (J')	0.60 ± 0.02	0.612	0.275	0.881	-0.05082	0.02005	-2.535	**<0.02***	0.1355
Abundance[2]	20.39 ± 1.81	20.3	4.3	52.6	0.2541	0.1696	1.498	0.142	0.05191
***F. alnus* in leaf litter (%) Mean = 4.46 ; SE = 0.775**									
Species Richness[1]	4.72 ± 0.14	5	2	6	-0.01791	0.02612	-0.686	0.497	0.01135
Effective number of species[1]	3.26 ± 0.13	3.25	1.4	5.34	-0.0287	0.0218	-1.317	0.195	0.04057
Shannon-Wiener index (H')	1.14 ± 0.04	1.18	0.34	1.68	-0.011252	0.008862	-1.27	0.211	0.03783
Evenness index (J')	0.73 ± 0.02	0.76	0.39	0.94	-0.007327	0.004766	-1.537	0.132	0.05451
Abundance [2]	25.73 ± 2.08	23.5	6.33	64	-0.02638	0.03937	-0.67	0.507	0.01083
Effective number of plants species (height < 1m) Mean= 7.07; SE = 0.3279									
Effective number of species[1]	3.26 ± 0.13	3.25	1.4	5.34	0.07452	0.06180	1.206	0.235	0.03425
Abundance[2]	25.73 ± 2.08	23.5	6.33	64	0.02116	0.09468	0.223	0.824	0.001217

[1] Species richness' variation and effective number of species are very low (from 2 to 6 species). This result must be interpreted with caution.

[2] Square root transformation

References

1. Barton, K. MuMIn: Multi-Model Inference. R package version 1.43.17. CRAN, *R package website*. **2020** https://CRAN.R-project.org/package=MuMIn (accessed on 12 January 2022)