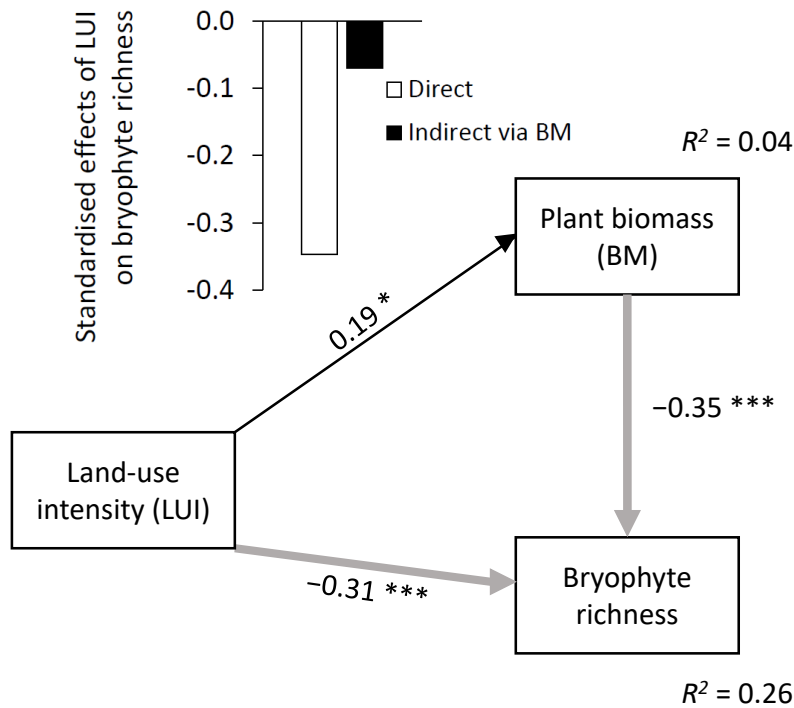


1 **Supplementary material**

2 **Table A.1:** Summary of linear mixed-effect models testing the effects of land-use intensity (LUI; observational dataset; see methods), as well as
 3 fertilization and irrigation (experimental dataset) on vascular plant biomass and bryophyte species richness in our investigated meadows. Significant
 4 differences are indicated by bold p-values at $P < 0.05$. R^2 denotes the squared correlation coefficient between predicted and observed values

	df	Vascular plant biomass				Bryophyte species richness				Bryophyte cover			
		Slope	SE	t	p	Slope	SE	t	p	Slope	SE	t	p
<i>Observational dataset</i>													
Intercept	1	245.55	27.98	8.78	<0.001	4.94	0.71	6.97	<0.001	17.13	4.88	3.51	0.001
LUI	1	35.16	14.89	2.36	0.020	-1.42	0.27	-5.21	<0.001	-4.31	1.60	-2.69	0.008
					$R^2 = 0.07$				$R^2 = 0.27$				$R^2 = 0.24$
<i>Experimental dataset</i>													
Intercept	1	396.32	29.78	13.31	<0.001	5.80	0.46	12.69	<0.001	0.32	0.21	1.53	0.132
Altitude	1	50.25	23.36	2.15	0.060	0.77	0.47	1.64	0.134	0.07	0.15	0.44	0.668
Fertilizer	1	5.26	0.67	7.90	<0.001	-2.22	0.29	-7.54	<0.001	-0.02	0.01	-3.63	0.001
Irrigation	1	0.60	1.38	0.44	0.662	-0.10	0.28	-0.36	0.721	0.01	0.01	1.24	0.221
					$R^2 = 0.66$				$R^2 = 0.71$				$R^2 = 0.38$

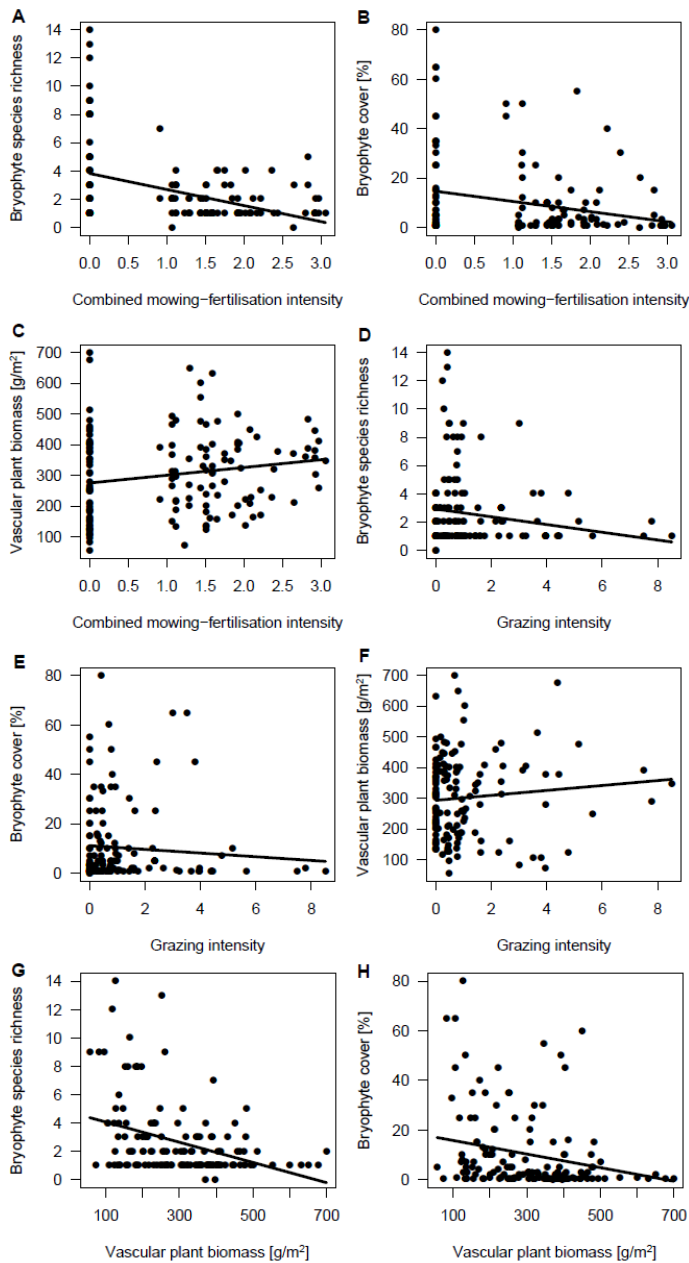
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7 **Figure A.1:** Structural equation model depicting direct and indirect effects of land-use
 8 intensity (LUI, observational dataset) and vascular plant biomass on bryophyte species
 9 richness. Numbers adjacent to arrows show standardized path coefficients and the width of
 10 the line is proportional to the size of the path coefficients. Black lines indicate positive and
 11 grey lines negative relationships. Asterisks next to path coefficients indicate p-values *** $P <$
 12 0.001; ** $P <$ 0.01; * $P <$ 0.05; n.s. $P <$ 0.1. The dashed arrows show co-variances between
 13 factors. R^2 denotes the proportion of variance explained for the endogenous variables.
 14 Standardized effects (direct times indirect effect) derived from the structural equation models
 15 depicted above.

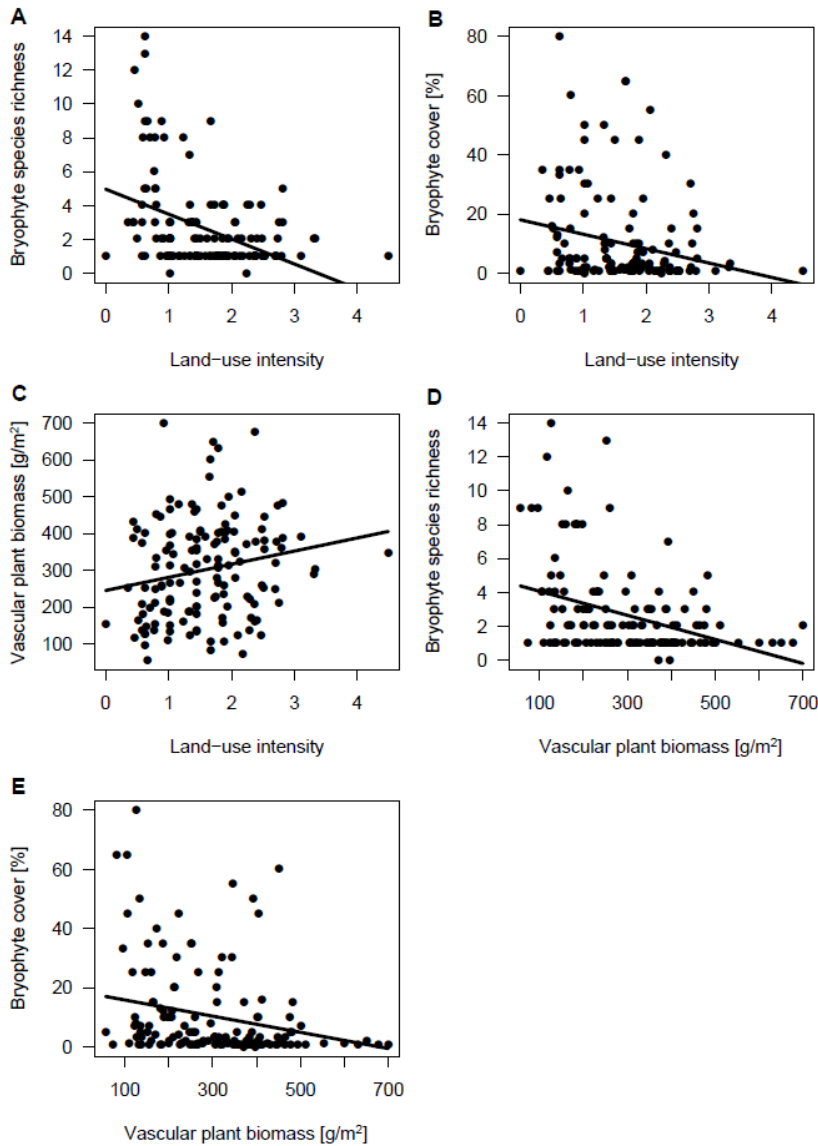
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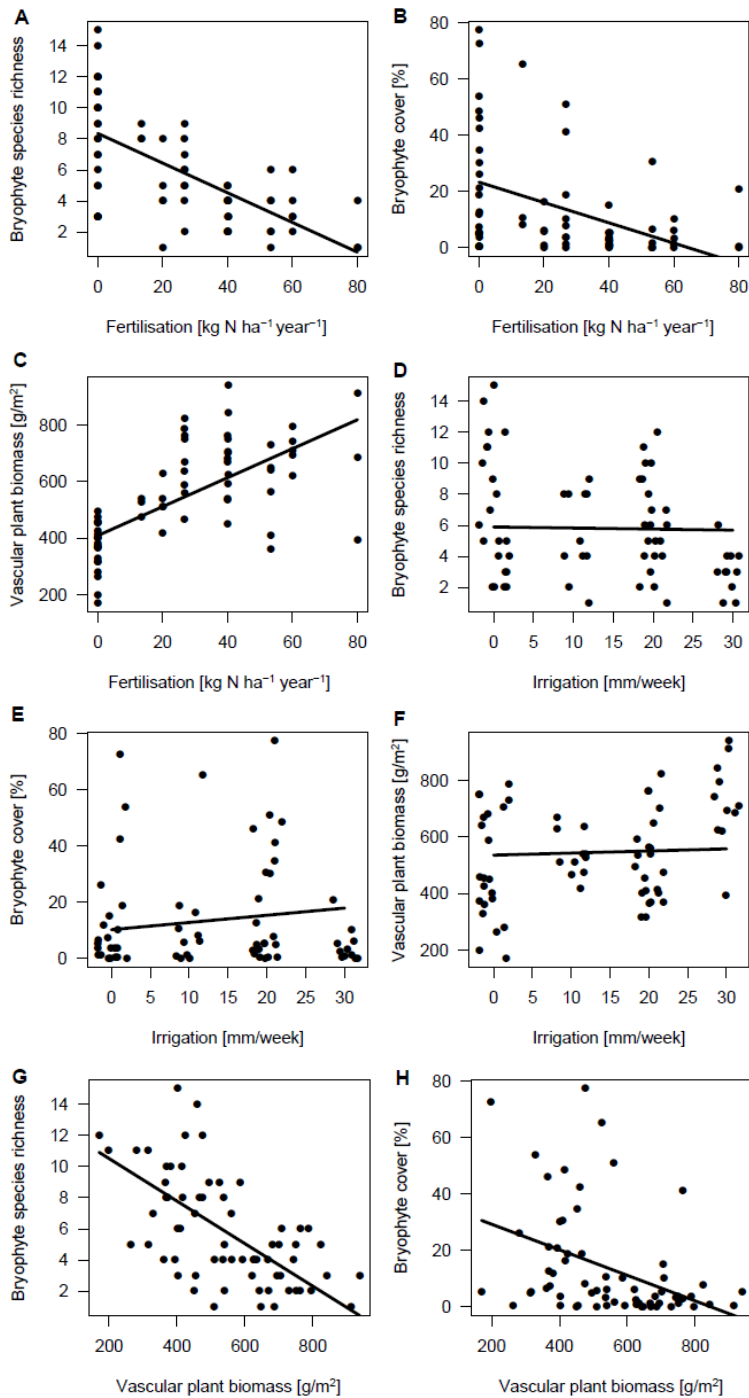
19 **Figure A.2:** Relationship between the combined mowing-fertilization intensity (integrated
 20 measure summing up the standardized intensities of mowing and fertilization; see methods)
 21 and A) bryophyte species richness, B) bryophyte cover and C) vascular plant biomass, grazing
 22 intensity and D) bryophyte species richness, E) bryophyte cover and F) vascular plant
 23 biomass, as well as the relationships between vascular plant biomass and G) bryophyte
 24 richness and H) bryophyte cover among the 144 plots of our observational dataset from the
 25 German Biodiversity Exploratories project. The regression lines are based on linear mixed-
 26 effect models.



28

29 **Figure A.3:** Relationship between land-use intensity (LUI; integrated measure summing up
 30 the standardized intensities of grazing, mowing and fertilization; see methods) and A)
 31 bryophyte species richness, B) bryophyte cover and C) vascular plant biomass, as well as the
 32 relationships between vascular plant biomass and D) bryophyte richness and E) bryophyte
 33 cover among the 144 plots of our observational dataset from the German Biodiversity
 34 Exploratories project. The regression lines are based on linear mixed-effect models.

35



36

37

38 **Figure A.4:** Relationship between fertilization A) bryophyte species richness, B) bryophyte
 39 cover and C) vascular plant biomass, irrigation and D) bryophyte species richness, E)
 40 bryophyte cover and F) vascular plant biomass, as well as the relationships between vascular
 41 plant biomass and G) bryophyte richness and H) bryophyte cover among the 66 plots of our
 42 experimental dataset from the Swiss mountain hay meadows. The regression lines are based
 43 on linear mixed-effect models.