Marc T. J. Johnson and Anurag A. Agrawal. 2005. Plant genotype and environment interact to shape a diverse arthropod community on evening primrose (*Oenothera biennis*). *Ecology* 86:874–885.

Appendix E (Table E1). A review of common garden studies examining how arthropod abundance and density is affected by plant genotype, environment, and their interaction at multiple spatial scales.

	<100 m		100 m – 1 km		1 km – 10 km		10 km – 100 km		>100 km	
	R^2	Cases	R^2	Cases	R^2	Cases	R^2	Cases	R^2	Cases
Genotype	8.5	24 (92)	10.5	2 (100)	9.8	5 (42)	8.4	2 (13)	9.5	1 (50)
Environment	8.4	17 (63)	7.5	1 (50)	31.8	6 (50)	32.0	11 (69)	21.0	2 (100)
G × E	3.6	7 (30)	3.0	1 (50)	8.3	2 (17)	8.0	2 (13)	6.5	2 (100)
n	18†	27‡	2	2	3	12	1	16	2	2

Notes: Using published ANOVA tables and additional results provided by authors, we calculated the mean total variation explained by each effect using the coefficient of variation (R^2). We also counted the number of cases where there was a statistically significant effect ($P < 0.05$) of genotype, environment, or genotype by environment interaction (G × E) on arthropod abundance or density. The percentage of significant cases is provided in parentheses. We reviewed eleven studies§ that looked at 40 unique plant-herbivore interactions in 58 independent experiments. The spatial scale was determined as maximum distance between gardens or spatial blocks in a study.

† $n = 15$ for G × E.

‡ $n = 23$ for G × E.

§ Studies reviewed: Maddox and Root 1987, Fritz and Price 1988, Fritz 1990, Strauss 1990, Stiling 1994, Quiring and Butterworth 1994, Stiling and Rossi 1995, Stiling and Rossi 1996, Rossi and Stiling 1998, Stiling and Bowdish 2000, Ylioja 2000.

Literature Cited

Fritz, R. S. 1990. Effects of genetic and environmental variation on resistance of willow to sawflies. Oecologia **82**:325–332.

Fritz, R. S., and P. W. Price. 1988. Genetic variation among plants and insect community structure: willows and sawflies. Ecology **69**:845–856.

Maddox, G. D., and R. B. Root. 1987. Resistance to 16 diverse species of herbivorous insects within a population of goldenrod, *Solidago altissima*: genetic variation and heritability. Oecologia **72**:8–14.

Quiring, D. T., and E. W. Butterworth. 1994. Genotype and environment interact to influence acceptability and suitability of white spruce for a specialist herbivore, *Zeiraphera canadensis*. Ecological Entomology **19**:230–238.

Rossi, A. M., and P. Stiling. 1998. The interactions of plant clone and abiotic factors on a gall-making midge. Oecologia **116**:170–176.

Stiling, P. 1994. Coastal insect herbivore populations are strongly influenced by environmental variation. Ecological Entomology **19**:39–44.

Stiling, P., and T. I. Bowdish. 2000. Direct and indirect effects of plant clone and local environment on herbivore abundance. Ecology **81**:281–285.

Stiling, P., and A. M. Rossi. 1995. Coastal insect herbivore communities are affected more by local environmental conditions than by plant genotype. Ecological Entomology **20**:184–190.

Stiling, P., and A. M. Rossi. 1996. Complex effects of genotype and environment on insect herbivores and their enemies. Ecology **77**:2212–2218.

Strauss, S. Y. 1990. The role of plant genotype, environment and gender in resistance to a specialist Chrysomelid herbivore. Oecologia **84**:111–116.

Ylioja, T., H. Roinen, J. Heinonen, and M. Rousi. 2000. Susceptibility of *Betula pendula* clones to *Phytobia betulae*, a dipteran miner of birch stems. Canadian Journal of Forest Research **30**:1824–1829.

[Back to E086-046]