Buckley J, Widmer A, Mescher MC, De Moraes CM. Variation in growth and defence traits among plant populations at different elevations: implications for adaptation to climate change. *Journal of Ecology*

Data S1: This data package contains all the data files required to replicate the plots and statistical analyses presented in the above manuscript, as well as a PDF document to aid understanding of the data included in these files.

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Data files in CSV format included in this package:
Aalpina_fielddata_totaldamage.csv
Aalpina_fielddata_frequencytypesdamage.csv
Aalpina_expt1_leaflength.csv
Aalpina_expt1_individuallarvalmass.csv
Aalpina_expt1_larvalsurvival.csv
Aalpina_expt2_growth_morphology_traits.csv
Aalpina_constitutive_glucosinolates.csv
Aalpina_induced_glucosinolates.csv

Details for interpreting the different data files

Data file: **Aalpina_fielddata_totaldamage.csv**
Description: Data for Figure 1b and Figure S3a,b. This file contains all the data on total number of leaves showing damage (of any type), as well as the total number of leaves on a plant and the % plant cover of the survey quadrat.
Key to column headings:

Site_ID	population identifier (used in Table S2 of supporting information)
Elevation	population elevation above sea-level
Elevation_cat	elevation category (low = <1600m, intermediate = 1600-2300m, high = >2300m)
Date_visited	date that the site was visited in 2016
Patch_ID	order in which the plants were surveyed along the transect
Perc_cover	percentage cover of the 18cm^2 quadrat by the focal plant
Total_N_leaves	total number of leaves on the focal plant
N_leaves_damaged	the number of leaves showing any sign of damage
N_leaves_undamaged	the number of leaves showing no sign of damage
Prop_damaged	N_leaves_damaged/total_N_leaves

***Data file*: Aalpina_fielddata_frequencytypesdamage.csv**
Description: Data for Figure S1. This file contains all the data on the presence or absence of four different damage types on the surveyed plants.
Key to column headings:

Site_ID	population identifier (used in Table S2 of supporting information)
Date_visited	date that the site was visited in 2016
Elevation	population elevation above sea-level
Patch_ID	order in which the plants were surveyed along the transect
Damage_presence	whether any form of damage was observed on the focal plant (Yes = 1, No = 0)
H_present	hole damage present on the plant (Yes = 1, No = 0)
D_present	chewing damage to edge of leaves present on the focal plant (Yes = 1, No = 0)
S_present	pale leaf spots present on the focal plant (Yes = 1, No = 0)
LT_present	larval leaf trails present on the focal plant (Yes = 1, No = 0)

***Data file*: Aalpina_expt1_leaflength.csv**
Description: Data for Figure S3d. This file contains leaf length measurements for all plants from experiment 1.
Key to column headings:

ind_ID	individual plant identifier in experiment
population	population identifier (used in Table S2 of supporting information)
year_seeds_collected	year in which seeds collected from parental plants in the field
elevation	population elevation in metres above sea-level
length_longleaf_mm	length of the longest leaf in millimetres

***Data file*: Aalpina_expt1_individuallarvalmass.csv**
Description: Data for Figure 1c. This file contains data on individual larval mass (of those larvae surviving at the end of experiment 1, after 8 days feeding).
Key to column headings:

population	population identifier (used in Table S2 of supporting information)
elevation_class	elevation category (low = <1600m, intermediate = 1600-2300m, high = >2300m)
elevation	population elevation in metres above sea-level
family_ID	maternal genetic family identifier (plants grown from seeds collected from same maternal plant)
rosette_surface_area_cm2	surface area of the rosette as estimated from two perpendicular measurements of rosette diameter; units are in cm^2
ind_larval_mass_mg	individual larval mass in milligrams after 8 days feeding

***Data file*: Aalpina_expt1_larvalsurvival.csv**

Description: Data for Figure 1d. This file contains data on larval survival on each of the experimental plants after 8 days feeding (each plant started with 5 larvae).

Key to column headings:

expt_id	plant identifier (and maternal genetic family) used in the experiment
elevation_class	elevation category (low = <1600m, intermediate = 1600-2300m, high = >2300m)
population	population identifier (used in Table S2 of supporting information)
elevation	population elevation in metres above sea-level
total_larvae	total number of larvae at start of experiment
number_alive	number of larvae alive at the end of the experiment (after 8 days)

***Data file*: Aalpina_expt2_growth_morphology_traits.csv**

Description: Data for Figure 2, Figure 3 and Figure S4. This file contains data on growth and morphology traits derived from experiment 2, as well as larval performance estimates after six days feeding.

Key to column headings:

ind_ID	individual plant identifier in experiment
population	population identifier (used in Table S2 of supporting information)
year_seeds_collected	year in which seeds collected from parental plants in the field
elevation_class	elevation category (low = <1600m, intermediate = 1600-2300m, high = >2300m)
elevation	population elevation in metres above sea-level
expt_set	due to space limitations, the plants were divided in to two experimental sets (A and B) that were assayed one week apart
lower_N_trichomes	the number of trichomes on the lower leaf surface of a 6mm diameter leaf disc
longest_leaf	length of the longest leaf in millimetres
number_leaves	number of leaves counted at the end of the experiment
SLA_cm_mg	specific leaf area estimated as leaf disc area divided by dry mass (value represents mean of four leaf discs, 6mm in diameter, per plant)
meanlarval_mass_mg	mean larval mass after 6 days feeding (based on those larvae surviving at end of experiment)

***Data file*:** **Aalpina_constitutive_glucosinolates.csv**
Description: Data for Figure 4, Table S4 and Table S5. This file contains the estimated amounts of constitutively produced glucosinolates in micromoles per gram of fresh tissue processed across 16 *Arabis alpina* populations, as well as three growth-related traits. Table S3 describes in more detail the glucosinolates identified in this experiment.
Key to column headings:

sample_ID	individual plant identifier in experiment
extraction_set	glucosinolates were extracted from samples in two batches (called set 1 and set 2)
population	population identifier (used in Table S2 of supporting information)
elevation	population elevation in metres above sea-level
elevation_class	elevation category (low = <1600m, intermediate = 1600-2300m, high = >2300m)
tissue_FW_g	fresh mass of leaf tissue from which glucosinolates were extracted (in grams)
total_mass_g	total aboveground fresh mass (in grams)
N_leaves_38d	number of leaves produced by the plant after 38 days growth
max_leaflength_38d	maximum leaf length in millimetres after 38 days growth
PG_umolg	micromoles per gram fresh tissue (FW) of Progoitrin or 2(S)-hydroxy-3-butenyl glucosinolate
X4MSB_umolg	micromoles per gram FW of 4-(methylsulfinyl)butyl glucosinolate
GSL1_umolg	micromoles per gram FW of unknown glucosinolate GSL1
X5MSP_umolg	micromoles per gram FW of 5-(methylsulfinyl)pentyl glucosinolate
GSL2_umolg	micromoles per gram FW of unknown glucosinolate GSL2
GN_umolg	micromoles per gram FW of gluconapin or 3-butenyl glucosinolate
GSL4_umolg	micromoles per gram FW of unknown glucosinolate GSL4
GSL5_umolg	micromoles per gram FW of unknown glucosinolate GSL5
GBN_umolg	micromoles per gram FW of Glucobrassicanapin or 4-pentenyl glucosinolate
X4MTB_umolg	micromoles per gram FW of 4-(methylthio)butyl glucosinolate
X9MSoN_umolg	micromoles per gram FW of 9-(methylsulfonyl)nonyl glucosinolate
X8MSO_umolg	micromoles per gram FW of 8-(methylsulfinyl)octyl glucosinolate
X4MeGB_umolg	micromoles per gram FW of 4-methoxyglucobrassicin or 4-methoxy-3-indolylmethyl glucosinolate
X5MTP_umolg	micromoles per gram FW of 5-(methylthio)pentyl glucosinolate
X9MSN_umolg	micromoles per gram FW of 9-(methylsulfinyl)nonyl glucosinolate
X10MSD_umolg	micromoles per gram FW of 10-(methylsulfinyl)decyl glucosinolate
HexGSL_umolg	micromoles per gram FW of hexyl glucosinolate
X7MTH_umolg	micromoles per gram FW of 7-(methylthio)heptyl glucosinolate
X9MSN2_umolg	micromoles per gram FW of 9MSN2 (dimer of 9MSN?) glucosinolate
X8MTO_umolg	micromoles per gram FW of 8-(methylthio)octyl glucosinolate
X9MTN_umolg	micromoles per gram FW of 9-(methylthio)nonyl glucosinolate
total_gsls_umolg	micromoles per gram FW of all glucosinolates combined

Data file: **Aalpina_induced_glucosinolates.csv**
Description: Data for Figure 5, Figure S6 and Table S6. This tab contains the estimated amounts of glucosinolates in the herbivore induction experiment. Table S3 describes in more detail the glucosinolates identified in this experiment.

Key to column headings:

sample_ID	individual plant identifier in experiment
date_sampled	date on which plants were sampled and measurements made
tissue_FW_g	fresh mass of leaf tissue from which glucosinolates were extracted (in grams)
run_ID	extracted glucosinolates were run on the LC/MS in two batches (run 1 and run 2)
population	population identifier (used in Table S2 of supporting information)
treatment	herbivore treatment: constitutive (no caterpillars) or induced (three caterpillars, 6 days feeding)
elevation_class	elevation category (low = <1600m, intermediate = 1600-2300m, high = >2300m)
GSL2_umolg	micromoles per gram fresh tissue of unknown glucosinolate GSL2
GN_umolg	micromoles per gram fresh tissue of Gluconapin or 3-butenyl glucosinolate
GSL5_umolg	micromoles per gram fresh tissue of unknown glucosinolate GSL5
GBN_umolg	micromoles per gram fresh tissue of Glucobrassicanapin or 4-pentenyl glucosinolate
PG_umolg	micromoles per gram fresh tissue of Progoitrin or 2(S)-hydroxy-3-butenyl glucosinolate
GSL1_umolg	micromoles per gram fresh tissue of unknown glucosinolate GSL1
X4MTB_umolg	micromoles per gram fresh tissue of 4-(methylthio)butyl glucosinolate
X4MSB_umolg	micromoles per gram fresh tissue of 4-(methylsulfinyl)butyl glucosinolate
X5MSP_umolg	micromoles per gram fresh tissue of 5-(methylsulfinyl)pentyl glucosinolate
GSL3_umolg	micromoles per gram fresh tissue of unknown glucosinolate GSL3
X7MTH_umolg	micromoles per gram fresh tissue of 7-(methylthio)heptyl glucosinolate
X4MeOGB_umolg	micromoles per gram fresh tissue of 4-methoxyglucobrassicin or 4-methoxy-3-indolylmethyl glucosinolate
X8MTO_umolg	micromoles per gram fresh tissue of 8-(methylthio)octyl glucosinolate
X8MSO_umolg	micromoles per gram fresh tissue of 8-(methylsulfinyl)octyl glucosinolate
X9MSN_umolg	micromoles per gram fresh tissue of 9-(methylsulfinyl)nonyl glucosinolate
X9MSN2_umolg	micromoles per gram fresh tissue of 9MSN2 (dimer of 9MSN?) glucosinolate
X10MSD_umolg	micromoles per gram fresh tissue of 10-(methylsulfinyl)decyl glucosinolate
9MSoN_umolg	micromoles per gram fresh tissue of 9-(methylsulfonyl)nonyl glucosinolate
total_gsls_umolg	micromoles per gram fresh tissue of all glucosinolates combined